COMMONWEALTH BUREAU OF ANIMAL HEALTH

THE

VETERINARY BULLETIN

Vol. 28] July, 1958 [No. 7

DISEASES CAUSED BY BACTERIA AND FUNGI

Asso, J. (1956). Identification par la lysotypie de quelques staphylocoques provenant de mammites bovines et ovines. [**Lysotypes of staphylococci isolated from cattle and sheep with mastitis.**] — *Thesis, Paris* (*Alfort*) pp. 58. **1993**

The author studied the action of 11 staphylococcal bacteriophages of ovine or bovine origin and 16 of human origin on 46 strains of mastitis staphylococci (40 from cattle and 6 from sheep). 15 strains were lysed by ovine/bovine bacteriophages and 6 by human bacteriophages.—R.M.

Barber, M. & Wildy, P. (1958). **A study of the antigenic specificity of staphylococcal coagulase in relation to bacteriophage group.** —*J. gen. Microbiol.* **18,** 92-106. [Authors' summary.] **1994**

Rabbit antisera were prepared separately against coagulase from staphylococci of each of the three main bacteriophage groups. Neutralization tests showed that each of the three antisera caused considerable delay in the clotting of plasma by coagulase from the autogenous staphylococcus and other strains of the same phage group, but little or no delay in the action of coagulase from strains of other groups. Staphylococci of certain phage types yielded coagulase which was not neutralized by any of the three antisera. Amongst these were types 3 A and 42 E which are usually included in groups II and III, respectively, as well as unclassified types (*e.g.* 187). Antisera prepared against coagulase from types 3 A and 42 E caused significant neutralization of coagulase of the same type only.

Schalm, O. W. & Lasmanis, J. (1957). **Distribution of micrococci and other bacteria in milk samples from a single dairy herd after twelve years of mastitis control.**—*Amer. J. vet. Res.* **18,** 778-784. **1995**

Measures directed against mastitis had been applied to a herd of 250 cows for 12 years. During the past 10 years there had been no *Str. agalactiae* mastitis. In 1955 and 1956 12,784 bacterial cultures were obtained from 17,927 milk samples. 71% of them were micrococci, 11% were coliform organisms, 9% were streptococci, 1% proteus, 0·07% *Pseudomonas aeruginosa* and 0·2% *Corynebact. pyogenes.* In cattle in their first and second lactations 25% of the micrococci were pathogenic strains but in cattle of five or more lactations 47% were classified as pathogenic. The results of Whiteside tests were compared with the bacteriological findings. —R.M.

Wilson, C. D. (1958). **Factors that predispose to mastitis with special reference to milking technique.**—*Vet. Rec.* **70,** 159-166. [Author's summary modified.] **1996**

It is considered that infection of the udder will only proceed to invasion, particularly with the less adapted parasites, when some external factor has lowered the resistance of the cow. The most common factor associated with mastitis is milking technique. The various aspects of the milking machine are considered, in particular liner design with special reference to bore, tension and softness. Pulsation rate and height of vacuum are doubtful factors in mastitis, but inadequate vacuum reserve with consequent surging has been implicated. A satisfactory milking technique would ensure that the cluster is removed from the udder as soon as milking has finished, without excessive stripping. The higher the vacuum, the faster the pulsation rate, the wider the phase ratio and the greater the tension on the liners, the faster will be the milking speed at peak milk flow; but while these facts have been established experimentally, it remains to be seen how they can be applied in commercial herds.

Pattison, I. H. (1958). **The progressive pathology of bacterial mastitis.**—*Vet. Rec.* **70,** 114-117. **1997**

The pathological processes occurring during the course of experimentally produced mastitis

due to various organisms are described. Infection of the cow with *Streptococcus agalactiae* takes place only through the teat canal. The organism multiplies in the milk ducts and initiates the crisis syndrome each time it invades through the duct walls into fresh areas of udder tissue. A great neutrophile and then macrophage response occurs when this happens and the duct epithelium reacts by becoming hyperplastic in each area invaded. Damage to the duct wall interrupts milk secretion and the gland involutes leaving a partially fibrosed largely involuted gland. In staphylococcal mastitis, the first stages are essentially the same but the organism usually establishes itself in the udder tissue in one massive initial invasion. It then lives and multiplies outside the milk duct system in numerous foci. Protective cells crowd into these areas, obliterating the mammary gland structure, and the irritant area is rapidly walled off by fibrous tissue. Early antibiotic treatment *via* the teat canal will eliminate *Str. agalactiae* from the udder and the prognosis for future milk production is good.—A. Ackroyd.

Mura, D. (1957). Su di una nuova forma di mastite infettiva e contagiosa delle pecore causata dallo *Streptococcus agalactiae*. **[Mastitis in sheep caused by *Streptococcus agalactiae*.]**—*Vet. ital.* **8,** 417-430. [English, French and German summaries.] **1998**

Mastitis in 8 flocks comprising 1,250 sheep was investigated. The flock incidence was 9·2–16·8% and mortality was 3–8·5%. The causal organism was identified as *Str. agalactiae* (Group B). The disease was reproduced experimentally in three sheep by injection into the udder of a 48-hour broth culture of the organism which was recovered in pure culture. Satisfactory results are claimed for a formolized autogenous vaccine.—T.E.G.R.

Pounden, W. D., Frank, N. A., Brown, R. W. & Scherer, R. K. (1957). **Nutrition and *Streptococcus agalactiae* activity in milk.** —*J. Amer. vet. med. Ass.* **131,** 65-67. **1999**

Further investigations of the effect of nutrition on the resistance of cow's milk to *Streptococcus agalactiae* were carried out. [See also *V.B.* **23,** 1790–1791, **26,** 3665–3666].

—T.E.G.R.

Wakim, K. G. & McKenzie, B. F. (1957). **The influence of streptococcal toxin on the course of canine experimental nephrosis.**—*J. Lab. clin. Med.* **50,** 410-416. **2000**

Nephrosis was induced in dogs by i/v administration of nephrotoxic serum obtained from rabbits sensitized to dog kidney. Streptococcal culture filtrate was administered to a second group of dogs while a third was given a mixture of rabbit serum and culture filtrate. The serum alone caused hypoproteinaemia (with reduction of serum albumin, alpha-1 and gamma globulins and variable, but sometimes increased, alpha-2 and beta globulins), elevated serum cholesterol and blood urea, and severe proteinuria which disappeared by the twentieth day after administration of the serum. The culture filtrate caused similar but, much milder changes which lasted for a much shorter duration. The serum–culture filtrate combination caused changes similar to those caused by serum alone but the proteinuria lasted longer, the reduction of gamma globulin was greater and the increase of serum cholesterol and blood urea was slightly higher.—T.E.G.R.

Levina, E. N. (1958). **[Fluorescein-labelled antibody for the detection of anthrax bacilli.]** —*J. Microbiol., Moscow* **29,** No. 1. pp. 9-15. [In Russian.] **2001**

The globulin fraction of anthrax precipitating serum was labelled with fluorescein isocyanate by the method described by Coons & Kaplan [*V.B.* **20,** 1972]. It was employed in agar diffusion tests with standard *B. anthracis* antigens and antigens of anthracoid organisms, and it gave specific and reliable results.—R.M.

Dormer, B. A. (1957). **Tuberculosis in South Africa.** — *J. S. Afr. vet. med. Ass.* **28,** 195-203. **2002**

D. gave a short account of the overall picture of TB. in S. Africa. He discussed the possible value of applying to the control of TB. in cattle experience gained in the control of the human disease with particular reference to *iso*-nicotinic acid hydrazide treatment and prophylaxis; he outlined experiments in progress and planned on these lines.—F.E.W.

Lesslie, I. W. & Davies, D. R. T. (1958). **Tuberculosis in a horse caused by the avian type tubercle bacillus.** — *Vet. Rec.* **70,** 82-84. **2003**

TB., proved by biological and cultural tests to be of the avian type, was found in an 8-year-old horse which had developed ulcerated swellings on its limbs and prepuce and enlarged submaxillary lymph nodes and ultimately had to be destroyed. The site of the primary infection was probably the alimentary tract.

—A. Ackroyd.

Paterson, A. B. (1957). **The tuberculin test in tuberculosis-free cattle.**—*Proc. R. Soc. Med.* **50,** 253-255. **2004**

In tests in cattle for the existence of non-

specific reactions to mammalian tuberculin, P. found that they were usually linked with reactivity to avian type tuberculin and were almost certainly caused by infection with the avian type of tubercle bacillus or *Mycobacterium johnei*. There was little evidence that saprophytic or intermediate types of mycobacteria were concerned. Since 1940 avian type tuberculin has been used simultaneously with mammalian type tuberculin in official tuberculin tests on cattle in Britain.

The causes of non-specific sensitization to mammalian tuberculin in cattle are:— (1) Avian type tubercle bacilli. Sensitization may occur without the development of lesions; it disappears after the source has been removed. Occasionally lesions or even generalized TB. may occur. Sources of sensitivity to the avian type tubercle bacillus are:— tuberculous poultry; swine (of little importance); birds other than poultry—pigeons, gulls, sparrows, starlings, wood-pigeons, pheasants and crows; rats. (2) *M. johnei*. Experimental and natural cases of Johne's disease develop early sensitivity to avian tuberculin which disappears as the disease progresses. (3) So-called "skin-tuberculosis". The nodular granulomata of this condition contain uncultivable acid-fast bacilli which have been found in experiments to sensitize to mammalian rather than avian tuberculin. (4) Human type tubercle bacilli; after removal of the cause the sensitization disappears. (5) B.C.G. and the vole bacillus sensitize to mammalian tuberculin. (6) Saprophytic mycobacteria. There is doubt about the capacity of the organisms of this group to sensitize. Experimentally, certain of the organisms have sensitized only when they were injected along with an oily adjuvant. (7) Organisms other than mycobacteria. Suggestions that certain micro-organisms and other factors may be responsible for sensitization lack proof. *Actinobacillus lignieresi, Br. abortus, Corynebacterium pyogenes, Actinomyces bovis* come within this category; also liver flukes, warbles and hydatid cysts.

P. described studies to ascertain the importance of non-specific reactivity to mammalian type tuberculin, using records from routine tests under the Attested Herds Scheme, on 100 herds in Berkshire and 200 herds in Cumberland. The degree of non-specific reaction to mammalian tuberculin was the same in the two counties, but there was a significant difference with avian tuberculin. He inferred that, if the non-specific response to mammalian tuberculin parallels the avian reaction, then the avian agency must be more efficient in Cumberland than in Berkshire.

There were age similarities and differences in the reactions. In both areas the response to mammalian tuberculin was broadly parallel with that to avian tuberculin. In Cumberland avian reactivity rose rapidly to a peak at four years of age with a slight downward trend to ten years of age. In Berkshire, on the other hand a much higher peak was reached at three years with significant differences at one, two, three and four years. In Cumberland the curve of reactivity to mammalian tuberculin rose slowly to a peak at eight years of age. In Berkshire cattle it started below the Cumberland curve, rose above it to a maximum at three years, became less at five to six years old and dropped to a minimum at nine years. P. stated that the curves for non-specific reactions to mammalian tuberculin indicated that either the quality of the sensitizing agent or the mechanism producing sensitivity differed in the two areas.

Figures for Berkshire indicated that the incidence of non-specific infection is higher in cattle in wooded regions than elsewhere; this was not the case in Cumberland. It had been suggested that the presence of wood-pigeons might be related to such reactions. P. inferred that factors other than woodlands appeared to be a greater influence.

The incidence of non-specific reactions appeared to decrease with increasing altitude. The reactivity to avian tuberculin was lower in the coastal areas of Cumberland than on the higher land. The effect of altitude was most marked in calves.

Neither the keeping of pigs or poultry on a farm, nor the breed of cattle appeared to be related to non-specific reactivity.—W.A.P.

TEUSCHER, E. (1957). Zur Känguruhtuberkulose. Pathologische Anatomie und Histopathologie bei behandelten und unbehandelten Tieren. **[Tuberculosis in the kangaroo: pathological anatomy and histopathology of treated and untreated animals.]** — *Zbl. VetMed.* **4,** 747-793. [English, French and Spanish summaries.] **2005**

Infection with bovine type tubercle bacilli occurred in 14 kangaroos (*Macropus bennetti*) in Zürich Zoological Garden. Diagnosis was by tuberculin tests and chest radiography. There is a detailed account of lesions (27 illustrations). Treatment of 4 cases with "Tebafen" tablets (a combination of isoniazid and nicotinaldehyde thiosemicarbazone) for several months appeared to halt the development of lesions, but did not lead to a cure.—R.M.

DOLOWY, W. C., FRANK, M. H., COX, G. E. & HESSE, A. L. (1958). **Detection of pulmonary**

tuberculosis in laboratory monkeys by chest radiography. — *Amer. J. vet. Res.* **19,** 225-229. **2006**

The authors do not agree with other workers that tuberculous lesions in monkeys are difficult to see in X-rays even when plentifully spread throughout the lungs. They found these lesions easy to demonstrate and concluded that radiography was a useful adjunct to diagnosis in advanced pulmonary cases. It was sometimes of value too in early cases but should be used only as an aid to the palpebral tuberculin test. The authors, however, have not great faith in the tuberculin test. Infection amongst their monkeys was chiefly by ingestion, the pulmonary lesions being secondary. It is thus evident that chest radiography could only be of value at the later pulmonary stage.

—R. N. FIENNES.

LA PLACA, M., MONTI, F., MULARGIA, A. & RASPI, E. (1957). Osservazioni sul potere patogeno del *"Mycobacterium tuberculosis"* di tipo bovino, resistente all'idrazide dell'acido isonicotinico. **[Pathogenicity of isoniazid-resistant *Mycobacterium tuberculosis* (bovine type).]**—*Zooprofilassi* **12,** 863-873. [English summary.] **2007**

In a limited series of experiments on rabbits and g.pigs it was observed that the isoniazid-resistant *Mycobact. tuberculosis* (bovine type) had a lower pathogenicity for these lab. animals than the non-resistant organism.—T.E.G.R.

DOYLE, T. M. & STUART, P. (1958). **Vaccination of cattle with B.C.G.**—*Brit. vet. J.* **114,** 3-10. **2008**

The results of the use of B.C.G. in a herd of 150 dairy cattle which contained many reactors to the tuberculin test are described. Calves were vaccinated within 10 days of birth, again at 6 months and then once a year. After 6 years, vaccination was discontinued except for one dose to new-born calves for a further two years. B.C.G. grown on Herrold's solid egg medium caused protein shock, but this did not occur when Sauton's medium was substituted. At the first tuberculin test after discontinuation of vaccination, 35% of the animals still had a reaction to mammalian tuberculin 7 mm. larger than that to avian tuberculin and at P.M. examination on 25 vaccinated animals, 10 had tuberculous lesions. Four had given doubtful reactions but over half the uninfected had also. After disposal of reactors, no positive reactions have occurred in any of the 100 home-bred unvaccinated animals which have entered the milking herd.—A. ACKROYD.

SEIBERT, F. B. & SEIBERT, M. V. (1957). **Relationship between immunity and circulating antibodies, complement and tuberculopolysaccharide in tuberculosis.** — *J. infect. Dis.* **101,** 109-118. **2009**

Immunity to experimental infection with virulent bovine tubercle bacilli could be produced in rabbits by multiple injections of living B.C.G. reinforced after challenge with additional injections of dead B.C.G. Vaccinated rabbits which showed a high level of antibodies to both tuberculopolysaccharide and tuberculoprotein showed resistance to infection, while those possessing only protein antibodies produced by injection of tuberculoprotein showed no resistance. In addition injection of protein either before or after inoculation with virulent bacilli increased the severity of the tuberculous process. Injection of tuberculopolysaccharide removed anti-polysaccharide antibodies *in vivo,* while injection of protein removed both anti-polysaccharide and anti-protein antibodies. The authors concluded that the presence of both types of antibody is necessary in serum for effective immunity, and that the difficulty of establishing a reliable serological test arises from *in vivo* combination of antigen and antibody.

—A. B. PATERSON.

POPP, L. (1958). Über die Neutralization von TB-Antikörpern in vivo. **[Neutralization of tuberculosis antibodies *in vivo*.]**—*Z. Immun-Forsch.* **115,** 56-72. [English, French and Russian summaries.] **2010**

P. sought an explanation of why some tuberculous human beings and animals failed to react to the haemagglutination-lysis test described by Middlebrook & Dubos. From serological studies on human beings and rabbits he concluded that neutralization of antibodies occurred in the blood whenever they or their haptens were washed out of tuberculous lesions.

—R.M.

I. ANON. (1957). **The stability in dilution of a purified derivative of tuberculin. A report on an investigation carried out on behalf of the British Tuberculosis Association.** — *Tubercle, Lond.* **38,** 99-105. **2011**

II. PATERSON, A. B. (1957). **The stability of stock PPD tuberculin.**—*Ibid.* 105-106. **2012**

I. Duration of storage did not appear to influence the potency of a buffered dilution of 10 tuberculin units/ml. of Weybridge P.P.D. tuberculin, but there were unexplained associations between the conditions of storage and potency. Under the Therapeutic Substances Regulations (1952) it is necessary for a bacterio-

static substance to be added to dilutions of P.P.D. tuberculin for human use. It was shown that merthiolate was unsuitable for this purpose because it decreased the potency of tuberculin.

II. Weybridge P.P.D. tuberculin was stored for 16–28 months in the dark at 2° to 4°C., either as a concentrated soln. (10 mg. P.P.D. per ml.) or as a buffered dilution (2 mg./ml.). The preparations did not deteriorate during storage but there was an unexplained slight increase in the potency of diluted tuberculin. —R.M.

MERKAL, R. S. & LARSEN, A. B. (1958). **Sensitization of cattle erythrocytes with johnin PPD and tuberculin PPD.** — *Amer. Rev. Tuberc.* **77,** 177-180. **2013**

When r.b.c. from five groups of cattle (cows, steers, bull calves and a bull), including animals of various breeds, with and without infection with acid-fast organisms, were used in the haemagglutination test, no correlation could be found between infection or freedom from infection, age, breed or sex, and the capacity of the r.b.c. to accept sensitization with johnin P.P.D. or tuberculin P.P.D. The r.b.c. from about half of the 133 cattle tested could not be sensitized with either. It was concluded that cattle r.b.c. are not satisfactory for use in haemagglutination tests for Johne's disease or TB. unless the particular donor's cells have been previously tested for ability to accept sensitization.—F.E.W.

CHANDLER, R. L. (1958). **Johne's disease of cattle and sheep in New Zealand.**—*Brit. vet. J.* **114,** 30-38. **2014**

In New Zealand, Johne's disease has increased in 8 years by over 500% to 513 reported cases in 1953 and is now widespread. The diagnosis is based on symptoms, history and a complement-fixation test of which Chandler's micro test has been adopted as the routine test in preference to that described by Hole. Vaccination as a method of control has been tried and has resulted in the elimination of clinical cases on the farms concerned, but has the disadvantage that vaccinated cattle react to the tuberculin test. The short thermal test may be of value to obviate this. Johne's disease has been observed in sheep on the Canterbury Plains, mainly in breeding ewes; mortality has to date been low.—A. ACKROYD.

WALLACE, J. H., ELEK, S. D. & HANKS, J. H. (1958). **Limited multiplication of *Mycobacterium lepraemurium* in cell cultures.**—*Proc. Soc. exp. Biol., N.Y.* **97,** 101-104. [Authors' summary modified.] **2015**

Quantitative determinations revealed significant multiplication of the rat leprosy bacillus in explanted spleen cells which had been infected *in vivo*; also in the L strain of mouse fibrocytes infected *in vitro*; provided the metabolism of the latter was altered by means of hydrocortisone. During periods of 8–10 days, the rate of multiplication closely approximated the maximal rates observed in susceptible animals.

DANNENBERG, A. M., JR. & SCOTT, E. M. (1958). **Melioidosis : pathogenesis and immunity in mice and hamsters. I. Studies with virulent strains of *Malleomyces pseudomallei*.**—*J. exp. Med.* **107,** 153-166. [Authors' summary modified.] **2016**

The pathogenesis of acute respiratory *Pfeifferella whitmori* infection in mice and hamsters is described. Inhaled organisms giving rise to lesions seemed to be first engulfed by the mononuclear alveolar phagocytes, but in less than 1 day polymorphonuclear cells appeared. However, the bacteria continued to multiply and focal necrosis developed, giving rise to septicaemia, toxaemia, and eventually death, usually in 3 to 10 days depending on the dose. In hamsters the disease developed more rapidly than in mice and death occurred sooner. The course in hamsters was sometimes complicated by intraglomerular deposits resembling "fibrinoid," which were similar to those of the generalized Shwartzman phenomenon. This phenomenon may have been an indirect cause of both the perifocal haemorrhage and the very large number of bacteria in some of the lesions. When low infecting doses were given, mice, but not hamsters, developed a chronic disease lasting 2 to 8 weeks, characterized by large abscesses in the spleen or lung, proliferation of mononuclear phagocytes and plasma cells, and increased immunity against re-infection (about fortyfold against respiratory challenge). When mice and hamsters inhaled high infecting doses, a peracute disease resulted with death in 1 to 3 days. Increased numbers of bacteria were observed in the lesions, and the histological changes in the spleen resembled those following i/v injection of *Pf. whitmori* toxin or i/m injection of large doses of cortisone. These changes were characterized by swelling of the phagocytes of the white pulp with nuclear debris. The peracute, acute, and chronic forms of melioidosis in mice are similar to analogous clinical forms in man.

JASKOLSKI, H., GRUDZIEŃ, C. & LIPIŃSKI, W. (1957). Półsyntetyczne podłoże płynne do produkcji antygenu różycowego oraz niezjadliwej kultury różycowej. [**A semi-synthetic**

liquid medium for the production of swine erysipelas antigen and avirulent culture.]—*Méd. vét., Varsovie* **13,** 677. [In Polish.] **2017**

The medium was based on peas hydrolysed by 3N hydrochloric acid; it consisted of pea hydrolysate 333 ml., monobasic potassium phosphate 0·1 g., dibasic sodium phosphate 4·2 g., sodium citrate 1·0 g., potassium nitrate 0·5 g. yeast dialysate 50 ml., peptone 5·0 g., and water *ad* 1000 ml.—M. GITTER.

DÖBÖRHEGYI, F. (1957). Sertésorbánc elleni csapadékos vakcinás oltás eredménye a kisunyomi állatorvosi körben. **[Vaccination against swine erysipelas in the district of Kisunyom.]** —*Mag. állator. Lapja* **12,** 358-359. [In Hungarian. English and Russian summaries.] **2018**

1180 Large White and crossbred pigs, kept out of doors, were vaccinated against swine erysipelas in March with adsorbed killed vaccine. This was repeated in July on 860 of these pigs. During the two months following the first inoculation 7 cases, and after the second inoculation 2 cases, of mild urticarial erysipelas occurred, which were readily cured by serum and penicillin treatment. During the third and fourth months after the first inoculation, however, besides 8 further urticarial cases, 4 fatal and 3 severe septicaemic cases occurred. In 18 of these 24 pigs other pathological conditions were observed, which were suspected to have been predisposing causes of these outbreaks. Two inoculations with a three-month interval with the adsorbed killed vaccine is suggested as the method for immunization of pigs against swine erysipelas each year.—A. SEBESTENY.

KUCSERA, G. (1957). Adatok a bőrskarifikáció-val végzett mesterséges sertésorbáncfertőzés időszakos sikertelenségének kérdéséhez. **[Seasonal failure in the method of evaluation of swine erysipelas vaccine by skin scarification in pigs.]**—*Mag. állator. Lapja* **12,** 222-223. [In Hungarian. English and Russian summaries.] **2019**

Erysipelothrix rhusiopathiae infection was carried out in 180 pigs from July 1953 until June 1956 by skin scarification. A nearly complete failure of infection was observed during November to January when the natural incidence is very rare, while during the rest of the year the rate of successful infection was 70–100%.—ANDREW SEBESTENY.

SANDVIK, O., MØLMEN, K. & KVAAL, M. (1958). **Septicemic listeriosis in new born lambs.** —*Nord. VetMed.* **10,** 17-20. [In English. German and Norwegian summaries. Authors' summary modified.] **2020**

An outbreak of septicaemia, probably caused by *Erysipelothrix* (*Listeria*) *monocytogenes,* affected 29 out of 75 lambs. They were treated successfully with antibiotics. The source of infection was not clear, but the organism was present in faeces in the sheep pen. As the length of time from birth to initial symptoms was similar in all cases, and as only one ewe aborted, it appears that infection took place at birth or in late pregnancy.

SICHERT, H., MOCHMANN, H. & MAHNKE, P. F. (1958). Listerienuntersuchungen am Hausschwein. **[Listeria infection in domestic pigs.]** —*Z. ImmunForsch.* **115,** 177-184. [English, French, Spanish, and Russian summaries.] **2021**

Between October 1956 and March 1957 890 pigs were examined at Rostock abattoir for *E. monocytogenes* infection. Cultural and histological tests were negative, although 740 of 890 sera agglutinated *E. monocytogenes* at titres of 1:800 or less.—R.M.

ROOTS, E. & STRAUCH, D. [Edited by.] (1958). Listeriosen. Symposion veranstaltet vom Veterinärhygienischen und Tierseuchen-Institut der Justus Liebig-Universität Giessen in Zusammenarbeit mit der Deutschen Veterinärmedizinischen Gesellschaft 27.-28. Juni 1957 in Giessen. **[Listeria infections. Symposium arranged by the Justus-Liebig University and the German Veterinary Medical Society at Giessen, 27-28 June 1957.]** pp. 116. Berlin (and Hamburg): Paul Parey. DM 14. [*Zbl. VetMed.* Suppl. No. 1.] **2022**

At this symposium the following papers were read:— Morphological and cultural properties of *Listeria monocytogenes* (H. Hartwigk); Serological diagnosis of listeriosis (H. P. R. Seeliger); Serological studies on some strains of *L. monocytogenes,* especially Type IV strains (J. Donker-Voet); The cell wall of *L. monocytogenes* (E. Roots); The pathological anatomy of listeriosis, especially in animals (G. Pallaske); Pathogenesis of listeriosis (H. Flamm); Listeriosis in man (J. Potel); The role of listeria in infectious mononucleosis (A. Nyfeldt); Listeriosis in animals (M. L. Gray); Further results of experiment and investigation in listeriosis of animals (F. Dedié); Experimental listeriosis in pregnant animals (M. L. Gray).

The papers by Donker-Voet, and Gray are in English, the remainder in German. Discussions follow each paper. The proceedings of the symposium are published by Paul Parey (Berlin & Hamburg) as Supplement No. 1 to

Zentralblatt für Veterinärmedizin. Abstracts of most of the individual papers will appear in the *Veterinary Bulletin.*—R.M.

BEARNS, R. E. & GIRARD, K. F. (1958). **The effect of pasteurization on** *Listeria monocytogenes.*—*Canad. J. Microbiol.* **4**, 55-61. **2023**

When known numbers of viable *Erysipelothrix* (*Listeria*) *monocytogenes* were added to samples of fresh sterile milk at the pasteurization temperature of 61·7°C. and held for 35 min., the organism could be recovered whenever the initial number of bacteria added was 5×10^4 per ml. or greater. No significant difference in heat resistance of various strains of the organism was observed. After 48 hours at room temp. (22°C.) survivors multiplied in such pasteurized milk and viable bacterial counts were found to reach 10^8 per ml. without producing any gross changes in the milk or suspicious odours.

The apparent greater heat tolerance of *E. monocytogenes* than of most other non-spore-forming, potentially pathogenic, bacteria together with its ability to grow at refrigeration temperatures, are properties worthy of consideration, since listeriosis has a widespread geographical and host distribution. Since the disease is not uncommon in ruminants and udder infections in cattle have been reported together with the isolation of *E. monocytogenes* from raw milk samples, it is possible that contaminated milk might serve as a source of infection and should be considered in any epidemiological investigation of listeriosis especially in the new-born.

—R. V. L. WALKER.

HOERLEIN, A. B. & MARSH, C. L. (1957). **Studies on the epizootiology of shipping fever in calves.**—*J. Amer. vet. med. Ass.* **131**, 123-127. **2024**

Results of studies on calves transported to "feedlots" from western ranches are discussed. The aetiology of "shipping fever" remains obscure but stress or fatigue appears to play the main role with micro-organisms acting as secondary invaders.—T.E.G.R.

I STAMATIN, N., GEORGESCU, V., GOGOAŞĂ, V., MORARU, E. & RĂDUCĂNESCU, H. (1957). Valoarea imunizantă a diverselor extrase chimice obţinute din soma speciei Pasteurella animalium. (Comunicare preliminariă.) [**Immunizing value of chemical extracts of** *Past. septica.*]—*Anu. Inst. Pat. Igien. anim.* **7**, 99-106. [In Roumanian. Summaries in French and Russian.] **2025**

II. STAMATIN, N. & GOGOAŞĂ, V. (1957). Valoarea imunizantă pentru şoarece a lizatelor penicilinice obţinute din *Pasteurella avium.* [**Immunizing value in mice of cultures of** *Past. septica* **lysed by penicillin.**]—*Ibid.* 143-151. [In Roumanian. Summaries in French and Russian.] **2026**

I. Subcutaneous inoculation of the first of two alkali extracts of broth cultures of *Past. septica* protected 27 of 28 mice from challenge after 18–20 days with 10 or 1,000 m.l.d. *Past. septica.* Other extracts had little or no immunizing properties.

II. A conc. of 100–200 i.u. of penicillin per ml. caused total lysis of broth cultures of pasteurella in 4·5 hours at 37°C. Lysis was preceded by a change in shape of the bacteria. The lysates obtained were mixed with aluminium hydroxide in the proportion 2:1 or 3:1. These preparations had the same immunizing value as formolized adsorbed corpuscular vaccine prepared from 48-hour broth cultures.—R.M.

GARCÍA RODRÍGUEZ, I. & HERRERA REPULLO, A. (1957). Una nueva enfermedad infecto-contagiosa del conejo y un nuevo germen patógeno. [**A new infectious disease of rabbits—pseudotularaemia caused by** *Past. pseudotularensis* **n. sp.**] — *Bol. Cons. Col. vet. Esp.* **1**, 29-38. **2027**

The disease occurred in a rabbitry comprising 350 rabbits of which 80% were affected, the younger ones being less susceptible. Mortality was 100%. The main symptoms were salivation, nasal discharge, dyspnoea, and difficulty in locomotion; the course of the disease was 4–6 days. P.M. findings included sero-fibrinous exudate (slightly haemorrhagic at times) in the pleural, pericardial, and peritoneal cavities, false membrane on the visceral pleura, petechiae and hepatization in the lungs and small foci of necrosis in the lungs, heart, kidneys and liver and, in some cases, abscesses (containing a thick whitish pus) on the inner aspect of the jaw and at the base of the neck. An organism was isolated from the blood, exudates and lesions. It was pathogenic for lab. animals and reproduced the disease in rabbits and white rats. By its morphological, staining and cultural characteristics it was identified as a pasteurella, closely similar to *Past. tularensis* but differing from it in motility, fermentation reactions, growth on egg or cystine, and in its pathogenicity for g.pigs. The name *Past. pseudotularensis* n. sp. is suggested for the organism and pseudotularaemia for the disease.—T.E.G.R.

UJVÁRY, G. (1958). Über die ätiologische Rolle der *Escherichia-coli*-Gruppe bei extraenteral lokalisierten Infektionen. I. Biochemische und serologische Untersuchungen.

II. Biologische Eigenschaften, Antibiotikum-Empfindlichkeit, Widal-Reaktion der Blutseren der Kranken. [**Aetiological role of the *E. coli* group in extra-enteric localized infections. I. Biochemical and serological investigations. II. Biological properties, antibiotic sensitivity, and the reaction of sera to the Widal test.**]—*Zbl. Bakt. I. (Orig.)* **170,** 394-405 & 406-422. [English, French, Spanish and Russian summaries.] **2028**

I. The biochemical and serological properties of 419 strains of *E. coli* isolated from urinary tract infections in human beings were compared with those of 277 strains from normal faeces, with special emphasis on "O" grouping. It was concluded that organisms isolated from the urinary tract were serologically similar to those present in normal faeces.

II. The ability of *E. coli* strains to cause necrosis, haemolysis and haemagglutination was related to the O:4 group. Antibiotic resistance was mainly confined to streptomycin. Of the 92 resistant strains, 55% belonged to group O:4. The serum of persons with chronic urinary tract infections was positive to the Widal test for typhoid agglutinins.—R.M.

LÖLIGER, H.-C. (1957). Die Verbreitung von Unfruchtbarkeit unter den männlichen Tieren verschiedener Ziegenrassen in deutschen und ausländischen Zuchtgebieten. [**Incidence of infertility in male goats of various breeds in Germany and other countries.**]—*Zuchthyg. FortpflStörungen u. Besamung* **1,** 201-215. **2029**

The incidence of blockage of seminal discharge ("spermatic granuloma") and testicular hypoplasia in young male goats was 15·3% in White German Improved, 18% in Fawn German Improved, and 24·3% in Swiss Toggenburg. These animals were housed and fed artificially, but in male Swiss Verzasca goats up to 3 years old which were at pasture the whole year no testicular hypoplasia was found and the incidence of "spermatic granuloma" was only 2·4%. Bacteriological examination revealed *Escherichia coli* in 27 out of 98 ejaculates from affected goats, but in only 2 out of 43 from healthy goats. It is considered that "spermatic granuloma" in goats is caused by local infection with enteric bacteria and that this may be encouraged by housing.—F. L. M. DAWSON.

TATUM, H. W., EWING, W. H. & DAVIS, B. R. (1958). *Escherichia coli* **O group 20 cultures possessing K antigen 61 (B7) in common with O86 : K61(B7) strains.** — *Publ. Hlth Lab.* **16,** 8-13. [Authors' summary modified.] **2030**

The occurrence of an *E. coli* O group 20 serotype that possessed K antigen 61 (B7), which hitherto has been found only in *E. coli* O86 : K61 (B7) serotypes, was described and the importance of the occurrence of the same B antigen in two different *E. coli* O antigen groups to diagnostic work was discussed. Also, several serotypes were characterized among cultures that belonged to *E. coli* O group 20 and two previously unrecognized B antigens were described.

NETER, E. (1957). **Detection of incomplete enterobacterial antibodies in cord blood by means of antiglobulin hemagglutination test.** —*Proc. Soc. exp. Biol., N.Y.* **96,** 488-491. [Author's summary modified.] **2031**

Fifty paired human maternal and umbilical cord sera were examined for O antibodies against Enterobacteriaceae. Agglutinins could not be demonstrated in the cord sera. The haemagglutination test revealed antibodies in 6 to 78% of the cord sera depending on the antigen used. The antiglobulin haemagglutination test detected incomplete antibodies in an additional 14 to 46% of the cord sera; this test enhanced the haemagglutinin titres of cord sera to a greater extent than those of maternal sera. With one exception the maternal antibody titres were higher than those of the corresponding cord sera. The specificity of the antiglobulin haemagglutination test was demonstrated by absorption tests. The placental transfer of enterobacterial antibodies from mother to foetus was discussed with particular reference to incomplete antibodies.

SAKAZAKI, R., NAMIOKA, S. & EDWARDS, P. R. (1958). **A new serotype of the Arizona group.** —*J. Bact.* **75,** 9-10. [Authors' summary modified.] **2032**

A new serotype of the Arizona group was described. This type, which was isolated both from man and animals had the antigenic formula 10a, 10c: 13, 15. It was suggested that the Arizona O group 10 be divided into two subgroups: 10a, 10b and 10a, 10c, these being related respectively to salmonella O antigens 40 and 1,49.

PEKERMAN, S. M. (1958). [**A disease of nutria associated with *Salmonella typhi*.**] — *J. Microbiol. Moscow* **29,** No. 2. pp. 111-112. [In Russian.] **2033**

S. typhi was isolated in pure culture from spleen, blood, bile and intestinal mucosa of a nutria which had died from purulent-fibrinous peritonitis.—R.M.

RHOADES, H. E. & HANSON, L. E. (1957). **Serological response of and pathogenesis of *Salmonella pullorum* in the growing chicken.** —*Poult. Sci.* **36,** 1065-1070. **2034**

Day-old chicks were each dosed with 0·25 ml. broth culture of *S. pullorum*. Serum agglutinin titres were highest 6 weeks after infection and then gradually decreased, becoming negative 7 months after infection. It was suggested that blood tests should be performed about the 6th week of age, earlier than is customary. The gall-bladder was the most consistent site of infection, but organisms were also present in the ovary and/or testicles at 8 weeks and at 7 months after infection.—R.M.

FISCHER, G. W. & RITZERFELD, W. (1958). Über einen Fall von Enteritis durch Salmonella lexington mit Nachweis des Erregers bei Haushühnern. [**Enteritis caused by *S. lexington*. Identification of the organism in fowls.**]—*Zbl. Bakt. I.* (*Orig.*) **170,** 635-636. **2035**

S. lexington caused an acute gastro-intestinal disorder in a man. The same organism was present in the faeces of 2 of 11 fowls kept by him.—R.M.

ANON. (1958). **The contamination of egg products with Salmonellae, with particular reference to *Salm. paratyphi B.* — *Mon. Bull. Minist. Hlth Lab. Serv.* 17,** 36-50. **2036**

The results are reported of examining 20,000 samples of processed eggs. Salmonella were isolated from dried and frozen whole egg, frozen egg yolk, and flaked, powdered and frozen albumen samples. Contamination was highest in the frozen whole egg samples (34%). Egg products from most countries were liable to contain salmonella, but none were found in those from Poland which are pasteurized. Of the 31 serotypes of salmonella isolated, 22 had been found in human infections in Britain between 1952–56. *S. paratyphi B* was isolated in 76 instances from frozen whole egg or albumen, all of Chinese origin; these strains accounted for 80% of the incidents in human beings in 1955–56. Salmonella, principally *S. typhimurium* were isolated from 30% of United Kingdom frozen whole egg products. It is concluded that much food poisoning and many outbreaks of paratyphoid in Britain have been associated directly or indirectly with contaminated egg products. Their danger lies not so much in the products being eaten uncooked as in the risk of other articles in a bakery becoming contaminated with them.—A. ACKROYD.

SWAHN, O. & RUTQVIST, L. (1957). Fodermedelspasteurising genom varmpelletering. Ett värdefullt led i salmonellabekämpandet? En preliminär rapport. [**Heat treatment of feeding stuffs by steam pelleting for control of salmonella. Preliminary report.**] — *Medlemsbl. Sverig. VetFörb.* **9,** 377-378, 380 & 383. [In Swedish. English summary.] **2037**

Samples of a consignment of lucerne hay meal from S. Africa suspected to have caused salmonella infection in flocks of fowls in 1956–57 were found to contain salmonella organisms; these were typed as *S. meleagridis, S. cubana, S. taksony* and *S. senftenberg*—all rare types in Sweden. Of 37 samples of the same material after steam treatment in a pelleting machine at 90°C. for about 3 min. at a constant pressure of 1·8 kg., one yielded *S. cubana* in culture. However 20 samples of a similarly pelleted mixture containing about 5% of the imported hay meal, and 229 samples of pellets prepared from the imported hay meal alone, were all negative. The total bacterial count of the imported meal was reduced from about 1,390,000 per g. to about 425,000 per g. after the pelleting process. —F.E.W.

CORNER, A. H. & CONNELL, R. (1958). **Brucellosis in bison, elk and moose in Elk Island National Park, Alberta, Canada.**—*Canad. J. comp. Med.* **22,** 9-20. **2038**

Serum samples from game slaughtered in the winter of 1956–57 in Elk Island National Park (where abortion and orchitis are common) were subjected to tests for brucellosis. Of 343 samples from bison 111 were positive, 34 suspect and 198 negative; of 221 samples from elk 25 were positive, 4 suspect and 192 negative. All of 124 samples from moose were negative. Two sick moose with symptoms of a severe, progressive generalized infection were also slaughtered. The clinical and P.M. findings are described. Serum samples from these animals were positive for brucellosis. *Pasteurella haemolytica* was isolated from the lungs and a corynebacterium was isolated from the kidneys of one animal; *Br. abortus* was isolated from various tissues of the other animal. Brucella orchitis was observed in two bison bulls which were destroyed. Serum samples from both animals gave positive reactions to the agglutination test and brucella was isolated from the pus and necrotic testicular tissue of one of these animals.—T.E.G.R.

SKURSKI, A. (1958). **Mechanism of the opsonocytophagic test in brucellosis.**—*Schweiz. Z. allg. Path.* **21,** 17-31. [In English. Summaries in French and German.] **2039**

Working with human sera, S. found that lack of phagocytosis or slight phagocytosis in active brucellosis was caused by a factor present in the thermolabile fraction of serum. Cytophagic antibodies in brucellosis were thermostable and did not require the co-operation of opsonins or a complement: the opsonocytophagic index revealed not the opsonins but specific thermostable cytophagic antibodies. The true antibody content of serum could be determined by a modified cytophagic method using inactivated serum. [See also *V.B.* **18,** 472.]
—R.M.

STINEBRING, W. R., FLICK, J. A. & POMALES-LEBRÓN, A. (1958). **Lack of correlation between skin test and "tissue" sensitivities in guinea pigs infected with *Brucella abortus*.** — *Proc. Soc. exp. Biol., N.Y.* **97,** 21-23. [Authors' summary modified.] **2040**

G.pigs experimentally infected with *Br. abortus* and which did not show a positive skin test upon i/d injection of bacterial extract usually possessed a "tissue" sensitivity to this antigen as shown by spleen in tissue culture.

VAN DRIMMELEN, G. C. (1957). **Strain 19 brucella vaccine. IV. Reduced risk of local reaction by subcutaneous inoculation into the external ear.**—*J. S. Afr. vet. med. Ass.* **28,** 119-128. **2041**

A new method of injecting brucella vaccine is described—s/c inoculation in the convex side of the ear, 1 to 2 cm. from the lower border. The full dose of Strain 19 can be given if suspended in 1 ml. of water. Heifers inoculated in this manner showed less swelling of the skin and s/c tissues than controls vaccinated in the neck. Average blood agglutination titres after 6 months were 1:31 in controls and 1:11 in experimental animals. Temperature reactions were similar in both groups. Four pregnant cows, vaccinated in the ear, were challenged with monthly doses of virulent *Br. abortus,* beginning at the 3rd or 5th month of pregnancy. Three calved normally and one aborted at full term but brucella organisms were not recovered.—M.G.G.

MCDIARMID, A. (1957). **The degree and duration of immunity in cattle resulting from vaccination with S. 19 *Br. abortus* vaccine and its implication in the future control and eventual eradication of brucellosis.** — *Vet. Rec.* **69,** 877-879. **2042**

343 cattle were immunized with 1, 2 or 3 five ml. doses of Strain 19 vaccine before breeding age. They were subsequently challenged, some at the first pregnancy, some at the second, and some at the third, or fourth, or fifth pregnancy, with 15×10^6 or 150×10^6 virulent *Br. abortus* Strain 544. The results disclosed that calfhood immunity does not deteriorate with age, irrespective of the method of vaccination; and multiple vaccination appears to give a slightly better immunity than single, but this advantage is outweighed by the persistence of agglutinins. It is concluded that one dose of vaccine, at 6 months of age, will confer an adequate immunity for at least 5 pregnancies and probably for the milking life of the cow.
—M.G.G.

BRILL, J. & GOŁĘBIOWSKI, S. (1957). Szczepy *Brucella suis* wydzielone ze świń po raz pierwszy w Polsce. **[The first isolation of *Brucella suis* from pigs in Poland.]** — *Acta microbiol. polon.* **6,** 115-132. [In Polish. English summary.] **2043**

During investigation of abortion in pigs on a state farm where 3 boars and 50 sows were kept, the authors isolated *Br. suis* var. *thomseni* from an epididymal abscess and from uterine exudate. Direct bacteriological examinations proved negative and the organism could be recovered only after two or three "blind" passages of the infective material through guinea-pigs. In agglutination tests on the g.pigs' sera using a "Weybridge Strain 99" as antigen, a positive titre could not be obtained earlier than 7–12 weeks after infection. On the same farm an atypical *Brucella* was recovered from a bovine foetus. Pickett's test with dye-tablets was found very useful in the differentiation of brucella species, but the test with sodium diethylthiocarbamate tablets described by Renoux gave inconclusive results.
—M. GITTER.

YUSKOVETS, M. K. (1957). **[Diagnosis of brucellosis in sheep.]** — *Trud. vsesoyuz. Inst. eksp. Vet.* **20,** 5-11. [In Russian.] **2044**

A double intradermal allergic test, with the second inj. 48–72 hours after the first, gave more reliable results than a single test. The following diagnostic programme was recommended for an infected flock. A double allergic test was followed 30–35 days later by combined agglutination and c.f. tests. There was a third examination 3 months after the second, by the double allergic test, and a fourth 5–6 months after the third by combined allergic and c.f. tests.—R.M.

MORYAKOVA, O. I. (1957). **[Immunization of sheep against brucellosis.]**—*Trud. vsesoyuz. Inst. eksp. Vet.* **20,** 12-22. [In Russian.] **2045**

Controlled lab. experiments were performed on 85 sheep. In the first experiment 22 uninfected sheep were each inoculated i/d with 10

milliards of Strain 19 organisms. After 6 months 100,000 organisms of *Br. melitensis* were inj. s/c and the sheep were killed a month later. Complete immunity, as evidenced by failure to isolate *Br. melitensis* from organs and tissues, was present in 7 of 13. Immunity was incomplete in the remaining 6 and was absent from 3 unvaccinated controls. Three other experiments were performed on the same lines as the first, with variations in the method of inoculation and dose of vaccine. In the fourth experiment there was 100% immunity after 7 months. *Br. abortus* Strain 68 was tried on 7 sheep and the results did not differ from those obtained with Strain 19. Subcutaneous or i/d inoculation gave better results than conjunctival. Positive reactions to serological tests appeared 15–25 days after vaccination and persisted for 2–3, or exceptionally 5 months.—R.M.

JACOTOT, H. & VALLÉE, A. (1958). Essai d'immunisation du rat blanc contre la brucellose. **[Immunization of white rats against brucellosis.]**—*Ann. Inst. Pasteur* **94,** 372-376. [English summary.] **2046**

The authors had reported in 1954 [*V.B.* **25,** 307] that they had obtained results contrary to general experience, namely that a phenol-killed brucella vaccine was as effective as a living vaccine of the same strain. In the present paper they confirmed these findings, stating moreover that a much smaller number of killed Strain 19 organisms produced in rats a better immunity than a larger number of living organisms against i/p challenge with a virulent culture of *Br. abortus* or *Br. melitensis* mixed with mucin (which killed all the controls).—F.E.W.

TUDORIU, C. D., IONICĂ, C., DRĂGHICI, D. & CAMBIR, S. (1957). Cercetări asupra brucelozei la iepurele sălbatic din R. P. R. [*Br. suis* **infection of hares in Roumania.**]—*Anu. Inst. Pat. Igien. anim.* **7,** 5-27. [In Roumanian. Summaries in French and Russian.] **2047**

Brucellar orchitis was found in 23 of 3,517 hares. Organisms isolated from 20 of the affected hares were identical with the Danish strain of *Br. suis* described by Bendtsen *et al.* [*V.B.* **26,** 1544]. The disease was confined to certain districts where 20–24% of hares captured were affected.—R.M.

STOENNER, H. G. & LACKMAN, D. B. (1957). **A new species of brucella isolated from the desert wood rat,** *Neotoma lepida* **Thomas.**—*Amer. J. vet. Res.* **18,** 947-951. **2048**

Five strains of a brucella were isolated from 108 wood rats captured in the Great Salt Lake desert. The strains differed from the established species in that they produced acid without gas in glucose, laevulose, xylose, arabinose and galactose; were sensitive to thionin and basic fuschin, and were more infective for mice than for g.pigs. The name *Brucella neotomae* was proposed.—R.M.

GARGANI, G. & BENELLI, S. (1957). Gli anticorpi incompleti nell'infezione brucellare. Ricerche sperimentali su sieri umani, suini e di cavia. **[Incomplete antibodies in brucella infection. A study of human, pig and g.pig sera.]**—*Bol. Ist. sieroter. Milano* **36,** 46-59. [English summary.] **2049**

Of 84 samples of human serum 26 were positive to the agglutination test at 1/10 and higher; of these 19 were also positive to the Coombs test at a slightly higher titre. Of 13 samples of pig serum 6 agglutinated at 1/10 and 1/20 and were positive to the Coombs test at 1/320. Incomplete antibodies were also demonstrated at 1/40 in sera which were negative to the agglutination test. All of 34 g.pig samples positive to the agglutination test at 1/320–1/1280 were positive to the Coombs test at high titres. These results are discussed.—T.E.G.R.

WEED, L. A. (1957). **Use of a selective medium for isolation of brucella from contaminated surgical specimens.** — *Amer. J. clin. Path.* **27,** 482-485. [Interlingua summary.] **2050**

Fresh-meat-extract agar with added glucose and blood is considered suitable for the isolation of brucella from surgical specimens. The same medium with cycloheximide, polymyxin B, "circulin" and bacitracin is useful for the isolation of brucella from clinical material containing other organisms.—T.E.G.R.

RICHARDSON, M. (1957). **Cytochrome oxidase in cells of the genus** *Brucella*.—*J. Bact.* **74,** 699-706. [Author's summary modified.] **2051**

R. described a method for the quantitative determination of the cytochrome oxidase activity of brucella. The activity of 24 thionin-sensitive strains of *Br. abortus* averaged 27; the activity of 4 thionin-resistant strains of *Br. abortus* averaged 10; that of 15 strains of *Br. melitensis* averaged 15; and that of 22 strains of *Br. suis* averaged 11. Although the degree of cytochrome oxidase activity differentiated recently isolated typical *Br. abortus* from *Br. suis*, it did not permit their differentiation from *Br. melitensis*.

RENOUX, G. (1958). La notion d'espèce dans le genre brucella. **[The concept of species in the genus** *Brucella*.**]**—*Ann. Inst. Pasteur* **94,** 179-206. [English summary.] **2052**

Excluding *Br. bronchiseptica* and *Br. tularensis*, whose position within the genus was doubtful, R. suggested that the so-called species of brucella were only biotypes of one species, which he would name *Br. melitensis*. A strain of brucella should be identified by the biochemical tests described by Huddleson and by the use of mono-specific sera.—R.M.

MORSE, E. V. & LANGHAM, R. F. (1958). **Experimental leptospirosis. III. Caprine *Leptospira pomona* infection.**—*Amer. J. vet. Res.* **19**, 139-144. **2053**

Four goats were infected with *L. pomona* by s/c inoculation of heparinized infected g.pig blood, and a fifth by contact with infected pigs for 31 days. No symptoms were observed. Gross lesions, which were minimal and found only in the kidneys, consisted of discrete greyish-white foci (containing lymphocytes, plasma cells and a few macrophages) which, on section, extended through the depth of the cortex and occasionally into the medulla. Meningitis and encephalitis were found in all the s/c inoculated goats. Leptospira, sometimes in large numbers, were present in the urine for up to 30 days after infection. They were found in the kidneys and in liver–spleen homogenate.—F.E.W.

KASZA, L., KEMENES, F. & SZEMERÉDI, G. (1957). *Leptospira hyos* okozta vetélések kocaállományokban. [*Leptospira hyos* **as cause of abortion in sows.**] — *Mag. állator. Lapja* **12**, 211-214. [In Hungarian. English and Russian summaries.] **2054**

Abortion in the late stages of the first or second pregnancy, and death of new-born piglets from within an hour to 5 days was observed in herds of Berkshire, crossbred and unspecified breeds of pigs. The urine of the affected sows contained *L. hyos* for six months and their blood contained the corresponding antibodies in a high titre, without clinical symptoms. In the interstitial tissue of the kidneys of the dead piglets *L. hyos* was demonstrated by silver impregnation. The Mangalitsa boar of the otherwise completely isolated crossbred herd was used on foreign sows during the same period, thus the introduction of infection could be attributed to the boar.

One Mangalitsa sow infected experimentally with *L. hyos* when in an advanced stage of pregnancy, gave birth 19 days later to 4 piglets, all of which died within 48 hours. It was suggested that porcine leptospira infection during the last fortnight of pregnancy is especially harmful for the piglets.—A. SEBESTENY.

BOKORI, J., KARSAI, F. & KEMENES, F. (1957). A kutyák Leptospira canicola okozta fertőzöttsége Budapesten. [*Leptospira canicola* **infection in dogs in Budapest.**] — *Mag. állator. Lapja* **12**, 309-312. [In Hungarian. English and Russian summaries.] **2055**

In a survey of 261 dogs in Budapest, 54 predominantly aged and male dogs were found to be infected with *L. canicola*, although they did not show any clinical symptoms apart from occasional albuminuria. Virulent strains of *L. canicola* were isolated from the kidneys of three of these dogs. In one of the suburbs of Budapest where a fatal case was observed, the incidence of infection was 35% while in a well isolated kennel it was only 5%. Infection with *L. icterohaemorrhagiae* was not observed in this survey.—A. SEBESTENY.

MURPHY, L. C., CARDEILHAC, P. T., ALEXANDER, A. D., EVANS, L. B. & MARCHWICKI, R. H. (1958). **Prevalence of agglutinins in canine serums to serotypes other than *Leptospira canicola* and *Leptospira icterohaemorrhagiae*—report of isolation of *Leptospira pomona* from a dog.**—*Amer. J. vet. Res.* **19**, 145-151. [Authors' summary modified.] **2056**

Leptospiral agglutinins were present in 16·2% of 357 serum samples from dogs when tested against seven live leptospiral antigens. Predominant *L. autumnalis* agglutinins were present in 41% of the serologically positive animals, in contrast to the 24% and 12% that were positive against *L. canicola* and *L. icterohaemorrhagiae*, respectively. Predominant agglutinin titres against *L. grippo-typhosa* (8%) and *L. ballum* (3%) were also found. A leptospire isolated from the urine of one dog which had a predominant *L. autumnalis* titre was characterized as *L. pomona* by cross-agglutination and agglutinin-absorption procedures.

MURPHY, L. C., CARDEILHAC, P. T. & CARR, J. W. (1958). **The prevalence of leptospiral agglutinins in sera of the domestic cat.**—*Cornell Vet.* **48**, 3-10. [Authors' summary modified.] **2057**

Leptospiral agglutinins were present in 17 (4·9%) of 350 cat sera as determined by the microagglutination test against 5 antigens: *L. pomona, L. djasiman, L. sentot, L. autumnalis*, and *L. grippo-typhosa*. The use of 12 additional antigens did not elicit any agglutination response. These were *L. andaman, L. semaranga, L. celledoni, L. bataviae, L. ballum, L. canicola, L. icterohaemorrhagiae, L. pyogenes, L. alexi, L. borincana, L. sejroe*, and *L. javanica*. Attempts to isolate leptospira from the

urine, aqueous humour, and kidneys by the inoculation of hamsters and Fletcher's media were unsuccessful.

SOLOSHENKO, I. Z. (1958). **[Role of blood-sucking arthropods in the transmission and maintenance of pathogenic leptospires. I. *L. icterohaemorrhagiae* infection.]** — *J. Microbiol., Moscow* **29**, No. 1. pp. 22-27. [In Russian.] **2058**

Natural *L. icterohaemorrhagiae* infection was found in grey rats and not in other rodents examined. None of the ticks, fleas or lice collected from 215 rats harboured the leptospire but experimentally it survived for 25 days in *Ornithonyssus bacoti* and up to a month in *Hyalomma asiaticum,* and the infection was transmitted to g.pigs by these ticks. The leptospires survived only 3 days in *Rhipicephalus rossicus* and did not survive in *Xenopsylla cheopis* or *Ceratophyllus fasciatus*.—R.M.

WYNOHRADNYK, V. & SOTIRIU, E. (1957). Cercetări cu privire la cultivabilitatea leptospirelor in medii lipsite de ser sanguin. **[Cultivation of leptospires in media not containing blood.]**—*Anu. Inst. Pat. Igien. anim.* **7**, 79-89. [In Roumanian. Summaries in French and Russian.] **2059**

The growth of 7 strains of leptospires on 525 different media was tested. The best results were obtained with beef hydrolysate (tryptic digestion for 48 hours) plus an extract of sheep erythrocytes.—R.M.

ZAHARIJA, I. (1957). Weitere in Kroatien aus Menschen isolierte Leptospirenstämme. **[Leptospira strains isolated from man in Croatia.]** —*Z. Hyg. InfektKr.* **143**, 604-613. **2060**

Twenty strains were isolated from the blood or urine of human patients; 5 were identified as *L. sejroe,* 1 *L. australis,* 8 *L. pomona,* 4 *L. canicola* and 2 *L. icterohaemorrhagiae.* The patients included 10 peasants, 2 slaughtermen, a swineherd, and a father and son who owned a dog with a high titre for *L. canicola*.—M.G.G.

BERG, M. & LEVINSON, S. A. (1957). **Hyperglycemia induced in dogs by *Clostridium perfringens* toxin.** — *Arch. Path.* **64**, 633-642. **2061**

Lethal doses of *Cl. welchii* toxin injected i/m into the hind limbs of dogs and massaged produced a hepatic glycogenolysis with hyperglycaemia and without glycosuria. There was a concomitant increase in serum inorganic phosphorus. Injections of solutions of arginine, glycine, methionine, and glucose before the injection of the toxin prevented the hyperglycaemia. Previous injections of saline solution did not affect the hyperglycaemia.—R.M.

APPLETON, G. S. & WHITE, P. G. (1957). ***Clostridium botulinum* type C. I. Studies on laboratory variables affecting toxin production and toxoid evaluation.**—*Amer. J. vet. Res.* **18**, 942-946. **2062**

Eight strains of Type C were examined. A South African strain produced the most stable toxin; the best toxin formation occurred in dialysed media. Toxoids were prepared and were tested in mice. A good toxoid protected mice from challenge after 14 days with 40,000 lethal doses of Type C toxin.—R.M.

KNETEMAN, A. (1957). **A method for the cultivation of anaerobic spore forming bacteria.** —*J. appl. Bact.* **20**, 101-107. **2063**

A description of a method that has been used in testing samples from meat canning factories under anaerobic conditions. K. used an aerobic coccus in the culture to absorb the oxygen, a type of *M. albus* referred to as Micrococcus B2. The optimum temperature for its growth is 30°C. The strong reducing capacity of this organism, together with its high catalase content, renders it useful for improving media that have been kept for some time after sterilization. The media used should not be rich and be such that gas formation is at a minimum; sugars should not be used. To render the surface film impervious to oxygen, a film of a vinylidine chloride polymer, Saran A 100 gauze, is so placed that it lies flat on the agar during cultivation. Heat cannot be used to sterilize the Saran; a mixture of 60 parts of 90% alcohol, 30 parts water and 10 parts conc. HCl was satisfactory. An indicator for anaerobiosis is added to the medium. The coccus grows quickly on incubation and quickly dies out.—W.A.P.

MORGAN, W. J. BRINLEY, MELROSE, D. R. & STEWART, D. L. (1958). **The diagnosis of *Vibrio fetus* infection in bulls.**—*Vet. Rec.* **70**, 93-98. **2064**

V. fetus could not be isolated by cultural examination of semen and preputial samples from 52 bulls although 16 of the bulls were subsequently shown by test mating to be infected. Catalase-negative and hydrogen sulphide-positive vibrios were frequently isolated. Insemination of vibrio-free heifers, using one per bull, and culture on thio blood agar within 4 weeks of insemination, of the anterior vaginal mucus proved the most satisfactory method of isolating *V. fetus* and yielded twice the number of positive cultures compared with uterine biopsy speci-

mens. Catalase-negative vibrios were isolated from the vaginal mucus of some heifers even when they had not been inseminated or served previously. Not all bulls which have an increased conception rate when streptomycin is added to their semen are necessarily infected with *V. fetus*.—A. ACKROYD.

RISTIC, M., WHITE, F. H. & DOTY, R. B. (1958). **Morphological and serological characteristics of fresh isolates of *Vibrio fetus* and other vibrios inhabiting the bovine and ovine genital tracts.**—*Amer. J. vet. Res.* **19,** 99-107. **2065**

Nineteen strains of *V. fetus* and non-pathogenic vibrios representing freshly isolated strains from cattle and sheep were divided into 6 groups based on the origin of the culture, colonial and cellular morphology, production of catalase and hydrogen sulphide and tolerance of 3·5% sodium chloride. Strains of Groups I, II and III were isolated from aborted ovine and bovine foetuses, were catalase positive, H_2S negative and failed to grow in 3·5% sodium chloride. Strains of Groups IV and V were isolated from the genital organs of normal animals, were catalase negative, produced H_2S and grew in 3·5% salt solution. Strains of Group VI isolated from genital organs of normal sheep were catalase positive, H_2S negative but grew in 3·5% salt soln.

Strains of *V. fetus* were isolated in either the smooth or "cut glass" colonial forms and the non-pathogenic strains in either the smooth or mucoid forms. The cut glass form was stable on subculture but the smooth colonies showed dissociation into granular, smooth, cut glass, mucoid and rough colonial forms. This variation occurred more frequently in liquid than on solid media and occurred especially in tryptose and thioglycollate semi-solid media. Colonial variants were associated with certain types of cell morphology, but there were no differences in the cellular morphology in the colonial types of *V. fetus* and the non-pathogenic vibrios.

The serum of a cow which had aborted did not agglutinate a formolized suspension of the homologous (cut glass) suspension but agglutinated a heated homologous suspension. This serum also agglutinated smooth and rough heated and formolized cultures of two strains of *V. fetus* as well as a formolized and heated antigen of a saprophytic vibrio. Furthermore, a saprophytic vibrio shared a common heat-stable antigen with *V. fetus* originally isolated in the smooth and cut glass colonial forms, but there was no antigenic relationship when formolized suspensions were used.

—W. J. BRINLEY MORGAN.

FRANK, A. H., BRYNER, J. H. & CARUTHERS, B. (1958). **A comparison of the effect of catalase-positive and catalase-negative vibrio on the fertility of cattle.**—*Amer. J. vet. Res.* **19,** 108-111. **2066**

A comparison was made of the fertility data of cows and heifers bred to bulls that were either infected with catalase-positive vibrio (*V. fetus*), catalase-negative vibrio or were vibrio-free. The conception rates were similar in the groups bred to either bulls carrying catalase-negative vibrios or to bulls that were vibrio-free. However, females bred to bulls infected with catalase-positive vibrios (*V. fetus*) showed an infertility with irregular oestrus cycles and requiring many services for conception. Catalase-negative vibrios were seldom isolated from females served by bulls carrying catalase-negative vibrios, whereas catalase-positive vibrios (*V. fetus*) were frequently isolated from females mated to *V. fetus* infected bulls. Two serological groups of catalase-negative vibrios were found, but no details were given. The use of such terms as C+ vibrios and C− vibrios throughout the paper is confusing and should be discontinued.

—W. J. BRINLEY MORGAN.

SZENT-IVÁNYI, M. (1957). A juhok büdös sántaságának gyógyítása antibiotikumokkal. [**Antibiotic treatment of foot rot in sheep.**]—*Mag. állator. Lapja* **12,** 300-303. [In Hungarian. English and Russian summaries.] **2067**

Ointments containing 10% chloramphenicol and oxytetracycline respectively, and a powder containing 2–3% oxytetracycline, applied after thorough surgical treatment, cured foot rot equally successfully in 10 sheep less than a year old and 10 sheep more than 2 years old; 12 of them were completely cured within 6 days, and 8 of them within 9 days after a repeated treatment. Three of 31 other sheep, and none of 5 rams needed repeated treatment 5 days after the application of oxytetracycline powder in conjunction with surgical treatment; this procedure is suggested for practical use. 45% of these sheep were found to be immune against the virus of contagious pustular dermatitis. It is suggested that this infection might play a role in predisposing sheep to foot rot.

—A. SEBESTENY.

HÖRTER, R. (1957). Enzootische Gehirnnekrobakteriose bei Schafen. [**Endemic necrobacillosis of the brain in sheep.**]—*Dtsch. tierärztl. Wschr.* **64,** 420-421. **2068**

An outbreak of necrobacillosis (*Fusiformis necrophorus* infection) of the brain is reported in a flock of 250 sheep. About 5% of them showed

various forms of incoordination, the lesions and organisms being confined to the brain and its membranes. The pathology and bacteriology of the condition are described in detail. Antibiotic therapy was ineffective.

—H. Scott McTaggart.

Downey, N. E. (1957). **Spinal abscesses as a cause of paralysis in sheep.**—*N. Z. vet. J.* **5,** 97-100. [Author's summary modified.] **2069**

D. recorded paralysis in sheep, particularly young lambs, resulting from abscesses close to the spinal vertebrae, and described the symptoms and morbid anatomy. The aetiology was not established; bacteriological findings were inconclusive. The possible mode of infection and the nature of the primary lesion were discussed briefly.

Albertsen, B. E. (1957). **Bactericidal effect of antibiotics in semen diluent on pathogenic bacteria in bull semen.**—*Thesis, Copenhagen* pp. 154. [In English. Danish summary.] **2070**

The author studied the bactericidal action of streptomycin, benzylpenicillin, neomycin, chlortetracycline, oxytetracycline, chloramphenicol and sodium azide on *Corynebact. pyogenes, Br. abortus, V. fetus* and "P" strains of pleuropneumonia-like organisms. Streptomycin was the most active against the first 3 organisms and oxytetracycline was rather less active; the remaining drugs were useless. None of the drugs affected the viability of P.P.L.O. in semen. Storage of freshly diluted semen plus streptomycin (1000 μg./ml.) for 15 min. at 37°C. or 1 hour at 30°C. combined maximum destruction of bacteria with minimum harmful effect on spermatozoa: this treatment destroyed nearly all *C. pyogenes* and *V. fetus* present in the semen.—R.M.

Keller, H. (1957). Einige Probleme bei de Verwendung von Antibiotika mit besonderer Berücksichtigung der bakteriellen Resistenz. **[Problems arising from the use of antibiotics, particularly bacterial resistance.]**—*Schweiz. Arch. Tierheilk.* **99,** 651-658. [In German. English, French and Italian summaries.] **2071**

K. stated that, in contrast with human medicine, the resistance of bacteria to antibiotics was of little importance in veterinary medicine. Among 341 pathogenic strains of staphylococci from mastitis in cows 4 were resistant to penicillin, 21 to streptomycin, and none to aureomycin. Of 128 strains of coliform bacteria 4 were resistant to streptomycin and 1 to aureomycin.—R.M.

Jones, W. F., Jr. & Finland, M. (1957). **Susceptibility of enterococci and of hemolytic streptococci of Groups A, B, C and G to five new antibiotics** *in vitro*.—*Amer. J. clin. Path.* **27,** 528-533. [Interlingua summary.] **2072**

The susceptibility of streptococci to erythromycin, streptogramin (antibiotic "900"), oleandomycin, spiramycin, novobiocin and cycloserine was tested *in vitro*. Erythromycin was the most active and cycloserine was the least active; novobiocin was appreciably less active than oleandomycin, spiramycin or streptogramin (each of which exhibited cross resistance with erythromycin). In the erythromycin group, spiramycin was the most active against strains of the other groups and oleandomycin had an intermediate activity against all of the groups. Groups A, B, C and G were susceptible to streptogramin and cycloserine in the order given.

—T.E.G.R.

Carter, J. S. & Buhler, V. B. (1957). **A rapid method for distinguishing atypical (yellow) acid-fast colonies from nocardia species.**—*Amer. J. clin. Path.* **28,** 423-426. [Interlingua summary.] **2073**

Material for culture of *Mycobact. tuberculosis* is digested with tri-sodium phosphate, according to the method described by Moss, inoculated on Löwenstein–Jensen medium and incubated at 37°C. Cultures are examined at weekly intervals. Yellow colonies are submitted to the neutral red cytochemical test and those giving a negative reaction are sub-cultured on Löwenstein–Jensen and on Sabouraud's media and incubated at room temperature. If acid-fast or Gram-positive organisms are present in direct smears of the colonies the organisms are inoculated into thioglycollate broth and on chlamydospore agar. In the former the atypical yellow acid-fast organisms grow in solid clumps slightly below the surface; nocardia forms a pellicle on the surface and growth extends upwards along the sides of the tube. On chlamydospore agar the yellow organisms grow in solid clumps; nocardia produces a fine network of branches identifiable microscopically after 2–3 days' incubation.—T.E.G.R.

Bennett, I. L., Jr. & Cluff, L. E. (1957). **Bacterial pyrogens.** — *Pharmacol. Rev.* **9,** 427-475. **2074**

The purpose of this review has been to summarize what is now known about the sources, chemical nature, and physiological action of bacterial endotoxins. Beginning with the "practical" problems of eliminating pyrogens from

fluids for parenteral infusion and the use of these substances in therapy, there has been an increasing interest in the role of these materials in the pathogenesis of infection. Endotoxins have been utilized in experimental studies of many diseases of non-infectious origin and have been invaluable in studies of fever and regulation of body temperature. The ubiquity of these bacterial products and their biological potency has led to misinterpretation of experimental results in many fields, and it is only in recent years that the tremendous importance of establishing that observed alterations in body temperature, leucocyte count, blood pressure etc. are not the result of undetected endotoxin contamination has been recognized widely.

Recent advances in our understanding of the enhancement of antibody formation, stimulation of the properdin system, and sensitization to epinephrine by bacterial endotoxins are summarized, and it is concluded that these substances and the reaction elicited by them deserve further study. The discovery of lipopolysaccharides in mammalian and plant tissues that are capable of eliciting host responses that are identical with those produced by endotoxins may open the way to a better understanding of diseases not only of bacterial origin but of many other aetiologies.

An evaluation of the efficacy of endotoxins in the therapy of human disease is handicapped by the uncontrolled studies that predominate in the published literature. For several disorders, however, there is no doubt about the beneficial action of endotoxins, and properly conducted clinical investigations of these materials as therapeutic agents are greatly needed.—R.M.

TYRRELL, E. A., MAC DONALD, R. E. & GERHARDT, P. (1958). **Biphasic system for growing bacteria in concentrated culture.**—*J. Bact.* **75,** 1-4. [Authors' summary modified.] **2075**

Populations up to 6×10^{11} viable bacteria per ml. were attained using a biphasic growth system consisting of a layer of solid medium overlaid with a small volume of broth. Cell concentrations of various bacterial species were thus increased two to thirtyfold over broth controls, usually without detriment to total yields.

I. SNEATH, P. H. A. (1957). **Some thoughts on bacterial classification.** — *J. gen. Microbiol.* **17,** 184-200. **2076**

II. SNEATH, P. H. A. (1957). **The application of computers to taxonomy.** — *Ibid.* 201-226. **2077**

I. It is considered that the classification of bacteria should be based on overall similarities and correlated features between strains. The differences between a classification and a catalogue are discussed.

II. The use of an electronic computer is advocated for the sorting out of all the available taxonomic data on bacteria, the classification of which should be based on overall similarities. —T.E.G.R.

JUNGERMAN, P. (1958). **Fungus mastitis: A case report.**—*Vet. Med.* **53,** 53-54. **2078**

Nocardia asteroides was isolated on four occasions from the same quarter of a cow in a herd in which antibiotic therapy had been used for mastitis. No other animals in the herd yielded the organism, but some had been disposed of because of mastitis that had failed to respond to antibiotics.—E. G. WHITE.

KADEN, R. H. (1957). **Precipitin studies for the identity of antigens in different species of sporotrichum.** — *Mycopathologia* **8,** 260-270. [In English. Author's summary modified.] **2079**

K. described a simple technique for the preparation of dissolved autoclaved antigens and of sonic vibrated antigens, the immunization of rabbits, and testing methods by precipitation in agar medium and in capillary tubes. Five different strains of *Sporotrichum* belonging to three species, *S. schenckii, S. beurmanni,* and *S. asteroides* were studied with regard to formation of precipitin lines in agar medium. The similarity in precipitin lines was interpreted as demonstrating the antigenic identity of these different *Sporotrichum* species. Precipitin tests in capillary tubes gave comparable results with poorer differentiation but superior sensitivity.

Temperatures of 4°C. stimulated intensity of precipitin lines. Dissolved sonic vibrated antigens altered the precipitin formation by changing and intensifying the precipitin lines.

Adsorption experiments with dissolved antigens gave unsatisfactory results in precipitin tests in capillary tubes.

SCHIRREN, C. & RIETH, H. (1957). Epidemiologische Untersuchungen zur Rinder-Trichophytie mit Hinweis auf die antimykotische Therapie. **[Epidemiological studies on *Trichophyton* infection in cattle and man, with reference to treatment.]**—*Tierärztl. Umsch.* **12,** 310-313. **2080**

This article from the dermatological clinic in Hamburg draws attention to an increased incidence of ringworm among the rural population around the city in the spring of 1956 and to the history of contact with affected cattle. Most cases were in children who played in cow-

sheds and handled affected calves and cows. A healing lesion on the arm of a veterinary surgeon is also illustrated. Ringworm was found in 38 of 217 cattle in 10 herds. The highest proportion of affected animals occurred in small herds where hygiene was poor. A year later these herds were almost free from infection, following improvements in hygiene and ventilation.

Cultures from the 38 cattle and 16 patients yielded *Trichophyton verrucosum*. Primary cultures were made on agar containing 0·1–0·5 mg. per ml. cycloheximide to prevent the growth of moulds. Various therapeutic agents are mentioned and veterinary surgeons are advised to use a suitable antimycotic agent when carrying out vaginal and rectal examinations.

On one farm the three children, parents, grandmother, maid and farm worker were all affected with ringworm.—E. G. WHITE.

DOLAN, M. M., KLIGMAN, A. M., KOBYLINSKI, P. G. & MOTSAVAGE, M. A. (1958). **Ringworm epizootics in laboratory mice and rats: experimental and accidental transmission of infection.**—*J. invest. Derm.* **30**, 23-25. **2081**

Natural *Trichophyton mentagrophytes* infection occurred in 1–2% of lab. albino mice and in 20% of a colony of lab. rats. Three laboratory workers contracted ringworm of the hands through handling infected animals. Culture of hair of rats and mice on arrival from breeding farms revealed that 18% harboured *T. mentagrophytes;* no visible evidence of infection was present. Some prophylactic procedures were suggested.—R.M.

TREVISAN, G. (1957). Rara forma cistica di actinomicoma endocranico. **[Intracranial actinomycosis in a cow.]** —*Veterinaria, Milano* **6**, 122-123. **2082**

When first examined the cow was standing with the hind legs wide apart and the fore legs close together; the head was extended on the neck which was fully flexed to the left so that the head was resting on the shoulder of that side. Locomotor ataxia was also present. The animal was slaughtered and P.M. examination revealed an actinomycotic granuloma in the cranial cavity involving the optic fossa and foramina; the pituitary fossa and pituitary body; the base of the pons and of the brain; the cavernous and sphenoidal sinuses and the internal carotid artery, the third, fourth and sixth cranial nerves and the olfactory and the maxillary branches of the fifth.—T.E.G.R.

MICHALSKA, I. (1957). Flora grzybowa i bakteryjna jako czynnik niszczący wełnę owczą. **[Fungal and bacterial flora associated with fleece rot.]**—*Acta microbiol. polon.* **6**, 171-188. [In Polish. English summary.] **2083**

M. examined material from 8 flocks (12 breeds of sheep) in various parts of Poland and found up to 4×10^6–2×10^9 micro-organisms per g. of wool. The microflora of fleece is not specific but rather typical of farmyard manure and decaying vegetable matter. M. is of the opinion that under certain circumstances the bacteria and/or fungi are capable of damaging the wool fibres severely. In this respect the most troublesome genera are: (fungi): *Stemphyllium, Cladosporium, Chaetomium, Sordaria, Trichoderma, Alternaria, Penicillium, Pestalozzia, Oospora* and *Streptomyces* sp.; (bacteria): *Proteus, Bacillus* (*B. subtilis* and *B. brevis*). Many of these organisms can survive technological processes to which wool is subjected in factories and can be found in the finished materials. M. recommends fungicidal and bactericidal treatment of fleece after shearing in order to prevent contamination of factories and storage places.—M. GITTER.

MARTINS MENDES, A. (1957). Aspectos do problema da peripneumonia em Angola. **[Aspects of the pleuropneumonia problem in Angola.]**—*Rev. Cienc. vet., Lisboa* **52**, 1-12. [In Portuguese.] **2084**

A historical review.—T.E.G.R.

CORDY, D. R., ADLER, H. E. & BERG, J. (1958). **The pathogenicity for swine of a pleuropneumonialike organism from goats.**—*Cornell Vet.* **48**, 25-30. [Authors' summary modified.] **2085**

Pigs inoculated i/v and i/p with a pleuropneumonia-like organism (PPLO) of goat origin developed arthritis, serositis, and meningitis. Clinical features, lesions, and recovery of the agent are described. The marked virulence for pigs of a strain originally isolated from goats is unusual for the ordinary host-specific PPLO group.

MOULTON, J. E. & ADLER, H. E. (1957). **Pathogenesis of arthritis in chicken embryos caused by a pleuropneumonia-like organism.** —*Amer. J. vet. Res.* **18**, 731-734. **2086**

A strain of P.P.L.O. was isolated from the pericardial sac of a hen. It was not antigenically related to strains isolated from respiratory diseases of fowls. When the strain was inoculated into the yolk sac of 48 chick embryos in the 8th day of incubation, 22 died after 3–8 days and the others were killed at intervals. Gross lesions of arthritis were present in the tibiofemoral joints of 18. Microscopic lesions present in other embryos enabled the authors to describe the pathogenesis of the arthritis.—R.M.

CHU, H. P. (1958). **Pleuropneumonia-like organisms and respiratory diseases of poultry.** —*Vet. Rec.* **70,** 55-64. **2087**

After describing the chief characteristics and some growth requirements on artificial medium of pleuropneumonia-like organisms, C. presented the main features of the various diseases affecting the respiratory system of poultry and methods for their identification. Pleuropneumonia-like organisms have been isolated from chickens affected by practically all kinds of respiratory infection so their isolation alone from fowls with a "cold" is not sufficient to justify a diagnosis of chronic respiratory disease of fowls. There is evidence that there may be more than one type of pleuropneumonia-like organism in poultry, some types being able to cause disease by themselves whilst others are only capable of acting as secondary invaders.

—A. ACKROYD.

PERRY, K. D. & BRIGGS, C. A. E. (1957). **The normal flora of the bovine rumen. IV. Qualitative studies of lactobacilli from cows and calves.**—*J. appl. Bact.* **20,** 119-123. **2088**

For this work eight fistulated cows and 12 normal calves (from weaning age to nine months old) were used. Twelve diets were used for the cows, covering both grazing and stall feeding with hay and concentrate diet. 204 samples from the cows yielded 64 isolates; 71 samples from the calves, 27 isolates. Lactobacilli constituted a major component of the microflora of the rumen. There was evidence that lactobacilli were progressively established in the rumen of the growing calf: *L. fermenti* predominated. In the adults, on a hay and concentrate diet *L. acidophilus* predominated. On a diet of or containing silage *L. casei* predominated. In grazing animals there was a relative paucity of lactobacilli and streptococci predominated. Two tables gave details of the physiological characters of the species of lactobacilli isolated, and details of the total isolates, predominant species and maximum counts on particular regimens.

—W.A.P.

WILSSENS, A. & BUTTIAUX, R. (1958). Les bactéries de la flore fécale de la vache saine. **[Bacteria in the faeces of healthy cattle.]**—*Ann. Inst. Pasteur* **94,** 332-340. [English summary modified.] **2089**

The faeces of 18 cows in the stable (during winter) and 19 grazing cows (in summer) were studied to determine the constituents of the intestinal flora. The results (given in a table) can be summarized as follows.

E. coli was constant and abundant, but the types associated with infantile gastro-enteritis were not found. *Escherichia freundii* was rather frequent. There was only a small number of *Proteus hauseri* and *morganii;* the first particularly in summer. *P. rettgeri* and *Providencia* were found only in grazing cows. *Salmonella* and *Shigella* were never isolated. *Streptococcus faecalis* was always absent, but the presence of *Str. faecium* was constant. *Str. bovis* was less often found. On Mabbit's medium it was possible to isolate *Lactobacillus* and *Microbacterium* in 80% of adult cows.

In contrast to the human intestine, that of the cow often contained *Bacillus;* the *licheniformis* and *subtilis* species were the most frequent.

The role played by food was demonstrated by the abundance of *Clostridium butyricum* in faeces of cows in the stable and its absence in summer, because it is present in silage, which is eaten only in winter; a similar but less marked phenomenon was observed with *Candida krusei* which is present in sugar beet pulp, also a constituent of the winter fodder.

Cl. welchii was never found, this was surprising and should be confirmed. *Micrococci* were found in all the specimens. *Staph. aureus* (coagulase positive) was rare. *B. antitratum* was not exceptional.

FLINT, J. C., ROEPKE, M. H. & JENSEN, R. (1958). **Feline infectious anemia. I. Clinical aspects.**—*Amer. J. vet. Res.* **19,** 164-168. [Authors' summary modified.] **2090**

Feline infectious anaemia is an acute or chronic disease characterized by emaciation, depression, anorexia, and a high initial temperature, with rapid development of a macrocytic, haemolytic anaemia. The authors described 30 clinical cases. They believed the aetiological agent to be a member of the genus *Haemobartonella,* and proposed the specific name, *Haemobartonella felis.*

In blood smears stained with Giemsa or Wright's stains, the organisms appeared as small cocci or rods on the erythrocytes. They are not always visible in peripheral blood smears. Frequently they are present for a day or two, disappear for a few days, and then reappear. Diagnosis is based on many factors which are not pathognomonic. Anisocytes are always present in the peripheral blood smear. The appearance of organisms on the erythrocytes is diagnostic, but their absence does not warrant a negative diagnosis. A haemoglobin value of 7 g./100 ml., or less, would suggest that the condition was feline infectious anaemia. The method of transmission has not been determined.

The mortality varies greatly. Many cats apparently overcome initial infections and become latent carriers of the disease. Stress conditions presumably produce relapses in some carriers. Comparatively few therapeutic agents have been tried in treating the disease. Blood transfusions are of great value in maintaining the patient, and injectable arsenical compounds and broad-spectrum antibiotics offer the best known method of treatment.

See also absts. **2151** (Bact. viscosum complicating swine fever); **2263** (Q fever and brucellosis antibodies in sheep serum); **2372** (C.S.I.R.O. report, Australia); **2373** (report, Uganda); **2375** (a glossary of mycology).

DISEASES CAUSED BY PROTOZOAN PARASITES

BEPPLER, W. A. & SCHWEIGER, L. B. (1957). **Amebicidal and trypanocidal activity of a new series of diamines.** — *Antibiot. & Chemother.* **7,** 513-520. [Spanish summary p. 557.] **2091**

The activity of 26 new compounds was tested *in vitro* against *Endamoeba histolytica* and *Trypanosoma cruzi.* The following rapidly killed trypanosomes at concentrations of 50–500 μg./ml.: N,N'-dipiperonyl-5,11-diaminopentadecane hydrochloride; N,N'-dipiperonyl-5,10-diaminotetradecane hydrochloride; N,N'-dimethyl-N,N'-di(2-ethylbutyl)-3,10-diaminodecane hydrochloride; N,N'-dimethyl-N,N'-dipiperonyl-3,10-diaminodecane hydrochloride.

—R.M.

WEINMAN, D. (1957). **Cultivation of trypanosomes.**—*Trans. R. Soc. trop. Med. Hyg.* **51,** 560-561. **2092**

W. emphasized the superiority of the cultural method in detecting trypanosomes. It was found possible to restore infectivity to cultures of *T. rhodesiense,* which had been maintained on isolation medium for three transfers during 30 days, by subinoculating upon isolation medium enriched with trehalose. All mice inoculated became infected whereas control cultures without trehalose were always non-infective.

—D. POYNTER.

BROWNLIE, W. M. (1958). **A new prophylactic trypanocide.**—*Vet. Rec.* **70,** 69. **2093**

Field trials in Africa showed that a single dose of "Prothidium", which is 2-amino-7-(2 amino-6-methyl-4 pyrimidylamino)-9-aminophenylphenanthridine 10:1'-dimethobromide, may protect cattle from trypanosomiasis for six months.—D. POYNTER.

GEORGESCU, L., CIOLCA, A., MEDREA, N., COROŞ, I. & MORARU, G. (1957). **[Chemoprophylaxis of dourine with antrycide methyl sulphate.]**—*Anu. Inst. Pat. Igien. anim.* **7,** 445-452. [In Roumanian. Summaries in French and Russian.] **2094**

Antrycide methyl sulphate (quinuronium sulphate) protected all rats from infection with an African strain of *T. equiperdum* for up to 10 days when administered at 5 mg./kg. body wt. An injection of 0·3 mg./kg. protected horses for at least 45 days.—R.M.

I. KAZANSKII, I. I. (1957). **[The new trypanocidal preparations furacillin, antrycide and pyraldin.]**—*Trud. vsesoyuz. Inst. eksp. Vet.* **21,** 345-356. [In Russian. French summary.] **2095**

II. NOVINSKAYA, V. F. (1957). **[Pyraldin in trypanosomiasis.]**—*Ibid.* 357-360. [In Russian. French summary.] **2096**

III. GUBAIDULLIN, L. S. (1957). **[Therapeutic properties of pyraldin in piroplasmosis of dogs, and immunity following treatment.]**—*Ibid.* 296-313. [In Russian. French summary.] **2097**

I. Furacillin (nitrofurazone) was given by mouth at a dosage of 0·1–0·2 g./kg. body wt. for mice and rabbits and of 0·1–0·15 g./kg. for camels. Complete recovery was observed after 3 daily doses in 93–100% of lab. animals with *T. ninae kohl-yakimovi* infection and in 10 of 12 camels with surra. Antrycide preparations were effective in the treatment and prophylaxis of surra in camels and mules. A 1:10 complex of the antrycide preparations with suramin, administered to mice at 0·5 mg./kg. and to camels at 3 mg./kg., was highly effective.

Pyraldin (an antrycide analogue) was administered s/c to horses as a 1:10 or 1:20 aqueous suspension at 1–1·5 mg./kg. body wt. A single dose inoculated 5 days before *T. ninae kohl-yakimovi* protected rabbits from infection.

II. N. reported preliminary trials, and toxicity and therapeutic tests of pyraldin on lab. animals and horses. At a dosage of 1 mg./kg. body wt. it cured surra in 34 camels and prevented it in 5 others.

III. A single s/c inj. of a 1:100 aqueous suspension of pyraldin at 0·5–1 mg./kg. body wt. cured 15 of 17 dogs with *Babesia canis* infection. The lethal dosage for dogs was 7–9 mg. per kg. Dogs treated for piroplasmosis with pyraldin were resistant to re-infection after 20–32 days. Phagocytosis of *B. canis* by macrophages and polymorphonuclear neutrophiles was ob-

served in smears of peripheral blood. The drug was also effective against *T. ninae kohl-yakimovi* infection in 3 puppies.—R.M.

MONSUR, K. A. & KHALEQUE, K. A. (1957). **Preparation of a purified antigen from Kedrowsky's bacillus for complement-fixation test for kala-azar.**—*Trans. R. Soc. trop. Med. Hyg.* **51,** 527-532. **2098**

A simple method for the preparation of the antigen from an alcoholic extract is described. The material obtained was highly antigenic and had practically no anticomplementary activity. —D. POYNTER.

DIAMOND, L. S. (1957). **The establishment of various trichomonads of animals and man in axenic cultures.** — *J. Parasit.* **43,** 488-490. **2099**

D. gave concise but complete details of the technique used, consisting essentially of purification of the cultures by allowing the organisms to migrate through V-tubes containing a modified C.P.L.M. medium, which was similar to that described by Fitzgerald *et al.* [*V.B.* **25,** 63]. —D. POYNTER.

MCLAUGHLIN, D. K. (1957). **The survival of *Trichomonas gallinarum* in chicken droppings.** —*J. Parasit.* **43,** 307. **2100**

Fresh caecal droppings containing numerous *Tr. gallinarum* were collected from experimentally infected chicks. The droppings were mixed and placed in Petri dishes at various temperatures. By means of a culture technique [See preceding abst.] it was determined that trichomonads survived 24 hours, but not 48 hours, in droppings kept at 37°C., and at room temp. they lived 120 hours at 60°C. The placing of moist filter paper in the Petri dishes did not affect the results.—D. POYNTER.

COSSEL, L. (1958). Nierenbefunde beim Meerschweinchen bei Klossiella-Infektion (Klossiella cobaye). [**Kidney lesions in guinea-pigs with *Klossiella* infection.**]—*Schweiz. Z. allg. Path.* **21,** 62-73. [English and French summaries.] **2101**

An account of the histology of the kidneys in guinea-pigs infected with the coccidium *Klossiella cobaye*.—R.M.

GETTA, G. I. (1957). [**Localization of piroplasms in catttle during different stages of infection.**]—*Trud. vsesoyuz. Inst. eksp. Vet.* **21,** 34-47. [In Russian. French summary.] **2102**

From a detailed study of 10 experimentally infected calves G. concluded that *B. bigemina* and *Françaiella colchica* first multiplied in erythrocytes in the capillaries of internal organs before they appeared in the peripheral blood. The multiplication of *F. colchica* was more intensive than that of *B. bigemina*. In both cases the greatest proportion of infected erythrocytes was seen in smears of heart muscle, kidney, adrenal gland and brain. There were relatively few protozoa in the liver and spleen. Examination of biopsy specimens of liver, spleen and lymph nodes had no advantages over examination of peripheral blood for early diagnosis of infection. For post-mortem diagnosis smears of heart muscle, kidney and adrenal gland should be made.—R.M.

MORDASOV, P. M. (1957). [**Haemosporidial infections of cattle in the Moscow oblast.**]—*Trud. vsesoyuz. Inst. eksp. Vet.* **21,** 48-64. [In Russian. French summary.] **2103**

Most cases of piroplasmosis in cattle were caused by *Babesia bovis*, but *Françaiella caucasica* also occurred in the Moscow oblast. Mixed infection with the two parasites was observed in 15% of cases. Besides *Ixodes ricinus*, other ticks present on cattle were *I. persulcatus* and *Dermacentor pictus*. It was not proved that *I. persulcatus* transmitted piroplasmosis. Control measures were discussed.—R.M.

VECHERKIN, S. S. (1957). [**Immunization of sheep against *Babesia ovis* infection.**]—*Trud. vsesoyuz. Inst. eksp. Vet.* **21,** 275-289. [In Russian. French summary.] **2104**

Sheep were immunized by s/c inoculation of 0·5 ml. blood from sheep at the height of acute infection, plus 0·25 ml. of 1% soln. sodium citrate in physiological saline, kept at 8° to 12°C. for 4 days. The sheep were carefully observed at the end of the 7-day incubation period and chemotherapy (haemosporidin or trypaflavine) was begun if a clinical reaction developed: untreated sheep developed acute piroplasmosis. Inoculated sheep were immune to infection 9 months later. Ticks (*Rh. bursa*) feeding on immunized sheep did not become infected. Two sheep which recovered from an Armenian strain of *B. ovis* and another which recovered from infection with a Crimean strain developed acute piroplasmosis when infected ticks from Azerbaijan were fed upon them 23 months later.—R.M.

MAL'TSEV, S. V. (1957). [**Transmission of *Theileria sergenti* infection in cattle by *Haemaphysalis bispinosa*.**]—*Trud. vsesoyuz. Inst. eksp. Vet.* **21,** 81-92. [In Russian. French summary.] **2105**

Seven half-engorged female *H. bispinosa* were taken from acutely infected cattle and

placed on a healthy ox. After 36 days small numbers of theileria were present in the peripheral blood and on the 39th day the ox developed clinical infection. 200 nymphs of the same species of tick, which had fed on an infected ox during the larval stage, were placed on a healthy ox: this animal developed theileria infection 26 days later. Transovarial transmission of the parasite did not occur.—R.M.

MAL'TSEV, S. V. (1957). [*Theileria sergenti* **infection in cattle.**]—*Trud. vsesoyuz. Inst. eksp. Vet.* **21,** 93-111. [In Russian. French summary.] **2106**

The incubation period of *T. sergenti* infection was 35 days and acute illness lasted for 15–25 days. Usually the parasites were observed in 40–50% of erythrocytes: the various forms were bacillary (1·71–2·01 μ), spherical (1·4–1·71 μ), oval (1·55–1·87 μ), pear-shaped (2·79–3·11 μ), anaplasmoid (0·45–0·5 μ) and and stellate (1·5 μ diam.). M. studied 506 cases and discussed differences from infections with other theileria. For treatment aminoacriquine was tested on 242 cattle and was claimed to be very efficacious when administered during the first 5 days of illness.—R.M.

I. RISTIC, M., WHITE, F. H., GREEN, J. H. & SANDERS, D. A. (1958). **Effect of cortisone on the mechanism of anaplasma immunity in experimentally infected calves. I. Hematological and immunoserological studies.** — *Amer. J. vet. Res.* **19,** 37-43. **2107**

II. RISTIC, M. & SIPPEL, W. L. (1958). **Effect of cortisone on the mechanism of anaplasma immunity in experimentally infected calves. II. Studies of pathological changes.**—*Ibid.* 44-50. [Authors' summaries modified.] **2108**

I. The relapse which ordinarily follows splenectomy in anaplasma-infected calves did not occur in 6 of 7 calves treated with cortisone for 4–5 weeks before splenectomy. The titres of complement-fixing antibody in these calves did not fall significantly after splenectomy. In infected calves given this hormone at splenectomy and for varying periods thereafter, an increase in the number of anaplasma and a decrease in c.f. antibody occurred after splenectomy as in untreated infected calves. A more proficient bone marrow activity, indicated by increased blood cell counts and an increase in circulating reticulocytes, was manifested in animals given cortisone for varying periods before splenectomy.

II. Hypertrophy of the spleen, inflammation and swelling of the mucosa of the gall-bladder, purplish discoloration of the bone-marrow, and petechiae of the pericardium, pleura and diaphragm were characteristic lesions in calves infected with anaplasma, which relapsed after splenectomy. The erythropoietic activity of the bone marrow was depressed, in contrast to an intense bone marrow activity in animals given cortisone before splenectomy. Leucocytic infiltration of the capsule of Glisson was the most pronounced hepatic change in animals which relapsed after splenectomy. Haematopoietic activity of the liver was indicated by foci of erythroblasts and normoblasts in 2 cortisone-treated infected animals.

General reduction of white pulp of the malpighian follicles, decrease in the number of lymphoblasts and increase of vacuoles and degenerated reticular cells of the germinal centres were more pronounced in the spleen of animals not given cortisone. The red pulp portions of the venous sinuses and the Billroth cords of the spleen were generally enlarged and contained many reticular cells of various sizes, giving the red pulp a cellular appearance.

KONYUKHOV, M. P. (1957). [**Pathogenesis of anaplasmosis in sheep.**] — *Trud. vsesoyuz. Inst. eksp. Vet.* **21,** 155-173. [In Russian. French summary.] **2109**

Twelve sheep were each inoculated i/v or s/c with 20–45 ml. blood from infected sheep. After an incubation period of 17–35 days after s/c inoculation or 7–14 days after intracerebral inoculation a low and irregular fever (40·4° to 40·5°C.) developed. There was pallor, and emaciation, despite good appetite. Changes in the blood, bilirubinaemia, gas exchange and post-mortem findings were described. It was concluded that after entering the body *A. ovis* multiplied mainly in capillaries of internal organs, and the accumulating parasites then entered peripheral blood. The action of the parasite and its toxin (demonstrated experimentally) was to destroy erythrocytes and to alter brain function so that erythropoiesis was inhibited. The result was anisocytosis. The anaemia increased respiration and gaseous and energy metabolism and decreased blood oxygen. These led to decreased oxygenation in tissues and caused the emaciation characteristic of the disease.—R.M.

MYALO, I. I. (1957). [**Mixed** *Anaplasma* **and** *Babesia* **infections in sheep.**] — *Trud. vsesoyuz. Inst. eksp. Vet.* **21,** 177-194. [In Russian. French summary.] **2110**

Experiments with 50 sheep revealed 4 clinical types of mixed infection, in 3 of which only one infection predominated. The fourth,

characterized by the presence of both *A. ovis* and *B. ovis* in the blood, was often fatal after 7–8 days. Infection with babesia of sheep which had recovered from and were carriers of anaplasmosis caused a relapse of the latter which resulted in severe mixed infection. Mixed infection resulted from the inoculation of sheep with 200 ml. blood from sheep that had recovered from mixed infection 15 months previously.

There was no evidence of antagonism between the two protozoa.

A. ovis retained its pathogenicity in citrated blood kept at 3°C. for 82 days, and in a solution of glucose, saccharose and citrate for 334 days.—R.M.

MEIER, H., HOLZWORTH, J. & GRIFFITHS, R. C. (1957). **Toxoplasmosis in the cat—fourteen cases.** — *J. Amer. vet. med. Ass.* **131,** 395-414. **2111**

Acute toxoplasmosis occurs in young cats and is characterized by high fever unresponsive to antibiotics. The disease may simulate panleucopenia or other acute abdominal disorders. The most conspicuous and typical sign is rapid pneumonic breathing of progressive severity. Dyspnoea and jaundice are highly suggestive. Leucopenia is a frequent finding.

Chronic forms of toxoplasmosis seen in older cats may affect the intestine or central nervous system. Granulomas of the intestine may be misdiagnosed as tumours, foreign bodies, intussusceptions or faecal masses. In the c.n.s. the organism may be associated with incoordination and convulsions.

Positive diagnosis may only be obtained by laboratory procedures, the organism being recovered through animal inoculation or egg or tissue culture of infective material. Other diagnostic procedures are the skin, complement-fixation and dye serological tests, as well as the microscopic examination of exudates, tissue imprints and sections.

Experience with one cat suggested that providing diagnosis is made early, pyrimethamine and sulphonamides might exert a favourable influence.—D. POYNTER.

HARBOE, A. & REENAAS, R. (1957). **The complement fixation inhibition test with sera from chickens experimentally infected with toxoplasms.** — *Acta path. microbiol. scand.* **41,** 511-516. [In English. Authors' summary modified.] **2112**

Sera from adult fowls experimentally infected with toxoplasms were found to inhibit complement fixation in a mixture of serum from toxoplasma-infected rabbits and toxoplasma antigen from infected egg membranes. The sera of the fowls were negative in the direct c.f. test, and the dye test also failed.

KENNEDY, C. C. & STEWART, R. C. (1957). **Balantidial dysentery: a human case in Northern Ireland.** — *Trans. R. Soc. trop. Med. Hyg.* **51,** 549-558. **2113**

The third case of balantidial dysentery in the British Isles is reported. A 10-year-old boy probably became infected by eating dirt mixed with pig faeces containing *Balantidium coli*. In a survey of healthy pigs slaughtered in Belfast the incidence of *Balantidium coli* was 74%. Experiments with flies suggested that they could act as mechanical carriers.—D. POYNTER.

GUTIERREZ, J. & HUNGATE, R. E. (1957). **Interrelationship between certain bacteria and the rumen ciliate *Dasytricha ruminantium*.**—*Science* **126,** 511. **2114**

D. ruminantium, previously starved for 48–72 hours, were observed to select and ingest small cocci, 0·5–0·8 μ in diameter, from a mixture of bacteria obtained from fresh rumen fluid. Small rod-shaped bacteria, $1 \times 1{\cdot}5$ μ in size, were seen also within the food vacuoles. The ciliates were cultured for 2 weeks in the presence of 2 species of rumen bacteria. In control cultures without the bacteria they died within 96 hours. It is concluded that holotrich rumen ciliates derive at least some of their nitrogen from ingested bacteria.—M.G.G.

ADLER, J. H., DYE, J. A., BOGGS, D. E. & WILLIAMS, H. H. (1958). **Growth of rumen microorganisms in an *in vitro* continuous-flow system on a protein-free diet.**—*Cornell Vet.* **48,** 53-66. [Authors' summary modified.] **2115**

A constant-flow system in which growth rates of rumen micro-organisms on a protein-free diet can be studied is described. It was observed that growth rate increases with time and rate of flow. Maintenance of the motility of the protozoa was related to increased total growth of the population, which was associated with dilution rates of 9% per hour or more.

See also absts. **2373** (report, Uganda); **2376** (book, veterinary protozoology).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

FOGEDBY, E. G. (1957). **Foot and mouth disease in Greece.** Rome: Food and Agriculture Organization of the United Nations Leaflet 1 p. [FAO/57/12/8892] **2116**

F. & M. disease is introduced into Greece either from Turkey or from imported frozen meat. Control is by sanitary measures and vaccination around the outbreak. A laboratory has been constructed for the production of vaccine, and will soon be operating.—R.M.

FOGEDBY, E. G. (1957). **Foot and mouth disease in Turkey.** Rome: Food and Agriculture Organization of the United Nations Leaflet 1 p. [FAO/57/12/8906] **2117**

The disease is normally endemic in Turkey, affecting about 500 of the 40,000 villages annually. An epidemic occurred in June/July 1957; in August 2,814 villages were infected. From 4 to 6% of the infected animals died. Very little vaccine was available. F. pointed out the danger of Asian strains of the virus reaching Europe through Turkey.—R.M.

MOOSBRUGGER, G. A. (1957). Quinze ans d'activité de l'Institut vaccinal fédéral de Bâle. [**Fifteen years of the Swiss Federal Vaccine Institute at Basle.**]—*Schweiz. Arch. Tierheilk.* **99,** 619-630. [In French. English, German and Italian summaries.] **2118**

The amount of foot and mouth disease vaccine produced by the Institute in 1956 was 7,440 litres (295,000 doses for cattle). 6,220 litres were used, mostly in Switzerland, although 1,430 litres were exported. Economics and technique of vaccine production are described.—R.M.

MARUCCI, A. A. (1957). **Direct complement fixation for detection of foot-and-mouth disease antibody in serums from experimentally infected cattle.**—*Amer. J. vet. Res.* **18,** 785-791. **2119**

A new technique was developed, incorporating the following details. To provide optimum conditions for complement activity, traces of Mg and Ca were added to the buffer soln. and the test mixture was adjusted to pH 7·4. Gelatin (0·5%) was added to the buffer to reduce non-specific loss of reacting components. Amboceptor and complement were standardized spectrophotometrically. The reaction mixtures were set up in the cold and the fixation period was 18–20 hours at 2° to 5°C. Fluid from F. & M. disease tongue lesions was used as antigen. By using three antigens prepared from type A, O or C virus, the test could be used for typing infection. The appearance and disappearance of c.f. antibodies during and after infection was studied in 16 cows.—R.M.

VARENNE, H. & DECHAMBRE, L. (1957). Le problème de la vaccination anti-aphteuse chez le porc. Essais et résultats de la méthode intradermique. [**Immunization of pigs against foot and mouth disease by the intradermal route.**]—*Rec. Méd. vét.* **133,** 309-318. **2120**

F. & M. disease broke out on a pig farm 9–22 days after s/c vaccination with A-O or with A-O and C (separately or combined). Vaccinated and non-vaccinated pigs were affected and O virus was isolated from them. Intradermal vaccination was carried out on some non vaccinated pigs of which 9 were, at the time, exposed to infection; of these 9 in contact 3 developed a mild form of the disease and the rest were unaffected. Spread of infection among adults was checked by i/d vaccination with A-O vaccine of all pigs, vaccinated and non-vaccinated. Results in new-born pigs were not wholly satisfactory and recourse was had to injection of citrated blood of cattle which had recovered from the disease.—T.E.G.R.

PAY, T. W. F. (1957). **The uses of tissue culture methods in foot-and-mouth disease research.** — *Vet. Rec.* **69,** 1449-1451 & 1452. **2121**

Special uses to which tissue culture methods can be put in F. & M. disease research include the large-scale culture of virus for vaccine production, assay of virus, virus multiplication studies, and diagnosis and typing. Pig and ox-kidney monolayer cultures can be used for the plaque counting method and for titration by means of the "limiting dilution of infectivity" method, whilst the use of suspensions of dispersed cells prepared by the action of trypsin on cattle tongue epithelium has proved useful in growth curve experiments. These have suggested that not all intracellular virus becomes non-infective during the latent period.

—A. ACKROYD.

SELLERS, R. F. (1957). **Some observations on the plaque technique.**—*Proc. R. Soc. Med.* **50,** 915-918. **2122**

S. discussed the formation of plaque-like lesions on monolayer cultures of pig kidney by various strains of F. & M. disease virus. The technique was used for the titration of virus and for the isolation and identification of pure virus clones; two strains of type S.A.T.2 virus

were compared by this method. The results of titration of F. & M. disease virus by the plaque method agreed with those obtained by other methods.—R.M.

BROOKSBY, J. B. (1957). **Some aspects of the serology of viruses.** — *Vet. Rec.* **69,** 1445-1449. **2123**

Flocculation of even the smallest viruses has been demonstrated with ultracentrifugal concentrates and precipitation by the agar gel diffusion method and thereby the relationship of size and concentration of virus antigen to their serological activity has been deduced. Detection of virus antigen by complement fixation is 10–100 times more sensitive than by direct flocculation. Serological studies of the soluble antigen combined with infectivity studies have shown that the virus of F. & M. disease contains relatively large (20 mμ) infective particles with a highly specific serological activity; on heating, these disintegrate and give rise to a product having increased serological activity and resembling in size and specificity the natural small (7 mμ) component which has complement-fixing activity but a low degree of specificity and no infectivity.—A. ACKROYD.

HANSON, R. P. & KARSTAD, L. (1957). **Enzootic vesicular stomatitis.**—*Proc. 60th Ann. Meet. U.S. live Stk sanit. Ass., Chicago,* 1956 pp. 288-292. **2124**

A large proportion of horses, pigs and cows on 11 farms in southern Georgia, U.S.A. had antibodies to vesicular stomatitis; the country is low-lying and contains much wet-land pasture. The disease is enzootic and appears in pigs in May or June; there are 6–7 months in the year when it is not encountered and a natural reservoir of the virus is a possible explanation. Antibodies were found in more than half the raccoons, wild pigs and deer investigated, but the method of transmission has not been established. Experiments showed that pigs and raccoons could be infected by feeding them infected material and also that frogs were very susceptible to the virus administered either orally or by s/c injection; they do not develop lesions or signs of the disease but carry the virus for some weeks.

The authors tentatively suggest the virus may be carried over the winter season in a cold-blooded animal and ingested in the spring by a raccoon or pig, which develops the infection; a vector may then carry it to deer, cattle and horses.—E.V.L.

RECZKO, E. (1958). Elektronenmikroskopische Darstellung des Virus der Stomatitis vesicularis in der Maulschleimhaut des Rindes. **[Demonstration of the virus of vesicular stomatitis in oral mucous membrane of cattle by the electron microscope.]**—*Zbl. Bakt. I. (Orig.)* **170,** 545-547. **2125**

Thin sections were prepared from epithelium taken from the edge of a fresh vesicle on the mouth of a calf infected with the Indiana strain of vesicular stomatitis virus. Numerous bacillary particles, 154 mμ long and 42 mμ wide, were seen in the intercellular spaces in the stratum spinosum. Such particles were not present in epithelium from normal cattle or cattle infected with papular stomatitis. (One photomicrograph).—R.M.

ȚAGA, M., BERBINSCHI, C., CÎRSTET, I. & COMAN, I. (1957). Cercetări asupra propagării virusului bolii lui Aujeszky in organismul porcului infectat experimental pe diferite căi. **[Distribution of Aujeszky's disease virus in pigs experimentally infected by various routes.]** — *Anu. Inst. Pat. Igien. anim.* **7,** 221-228. [In Roumanian. Summaries in French and Russian.] **2126**

16 piglets were killed 2, 4, 6, 10 or 14 hours after experimental infection and the virulence of various organs was tested on rabbits. It was concluded that the intradermal and nasal routes were most favourable for infection, and that the virus spread from the site of infection by way of the lymphatic system.—R.M.

KERÉKJÁRTÓ, B. & ROHDE, B. (1957). Über die Vermehrung des Aujeszky-Virus auf Affennieren-Epithelkulturen. **[Multiplication of Aujeszky's virus on epithelial tissue from apes' kidney.]**—*Z. Naturf.* **12b,** 292-298. **2127**

The virus was passaged 31 times in tissue culture of monkey kidney epithelium. It had a constant and characteristic cytopathogenic action which could be utilized for virus titration. Multiplication commenced after a latent period of 12 hours and reached a maximum after 24 hours. Passage in tissue culture did not decrease the pathogenicity of the virus.—R.M.

STRYSZAK, A. (1957). Sytuacja epizootyczna po 6 latach szczepień psów przeciw wściekliźnie. **[Six years of antirabic vaccination in dogs in Poland.]**—*Méd. vét. Varsovie* **13,** 705-708. [In Polish. English and Russian summaries.] **2128**

Although antirabic vaccination reduced considerably the incidence of the disease in Poland, 41 outbreaks involving 75 animals were still recorded in 1956. S. recommended the speeding up of the vaccination programme especially in view of the increasing numbers of wolves. He could not find the rabies virus in

the saliva of vaccinated dogs even when the animals were exposed after vaccination to bites from infected animals.—M. GITTER.

POPOVICI, I. & STAMATIN, L. (1957). Cercetări asupra inocuităţii şi proprietaţilor imunizante ale virusului rabic fix încorporat în gel de hidroxid de aluminiu. **[Safety and immunogenic properties of rabies fixed virus incorporated in aluminium hydroxide gel.]** — *Anu. Inst. Pat. Igien. anim.* **7**, 201-207. [In Roumanian. Summaries in French and Russian.] **2129**

Rabies fixed virus (Babes' strain from a wolf) in 5 g. of infected sheep's brain was mixed with 45 ml. water and 100 ml. aluminium hydroxide gel at pH 7·6. 9,470 dogs were each inoculated with 2–3 ml. of this preparation: two cases of fatal post-vaccinal paralysis were reported. Sheep inoculated with 3 ml. were immune from the 5th day to the 10th month. The vaccine possessed several advantages over phenolized vaccine.—R.M.

HANSON, R. J., KEMPF, J. E. & BOAND, A. V., JR. (1957). **Phagocytosis of influenza virus. II. Its occurrence in normal and immune mice.**—*J. Immunol.* **79**, 422-427. [Authors' summary modified.] **2130**

Phagocytosis of PR8 influenza virus was studied by injecting large quantities of purified virus i/p into normal and immune mice. Using the fluorescent-antibody technique to demonstrate intracellular virus, and the haemagglutination and infectivity measurements to demonstrate free virus, the following observations were made in normal mice: (1) The virus adsorbed on to the lymphocytes normally present in the mouse peritoneal cavity and agglutinated them within a few min. (2) Within an hour a leucocytic infiltration of neutrophiles occurred. Free virus, adsorbed on to these cells, agglutinated them in 4 hours while phagocytosis occurred after 16 hours. (3) Virus persisted in the peritoneal cavity for 28 hours.

A similar sequence of events occurred in mice with low antibody titres. In mice with high antibody titres phagocytosis of virus was demonstrable as early as 8 hours after virus injection, while infective virus remained for 12 hours. Leucocytes from these mice contained no infective virus 12 hours after virus injection.

BURKE, D. C. & ISAACS, A. (1958). **Further studies on interferon.**—*Brit. J. exp. Path.* **39**, 78-84. [Authors' summary modified.] **2131**

The production of interferon by varying amounts of virus inactivated by heat or by ultraviolet light was examined. The results suggest that interferon is newly synthesized in the membrane, rather than part of the inactivated virus. Interferon was produced on the chick chorion by virus inactivated by ultra-violet light. Live influenza virus grown under similar conditions or heavily irradiated virus did not produce interferon, whereas incomplete virus produced good yields. The findings suggest that interferon is produced by virus in which the nucleic acid has been slightly, but not heavily, damaged.

BURNS, K. F., FARINACCI, C. J. & SHELTON, D. F. (1957). **Virus of bats antigenically related to Group B arthropod borne encephalitis virus.**—*Amer. J. clin. Path.* **27**, 257-264. [Interlingua summary.] **2132**

A neurotropic virus was isolated from the salivary glands of bats in Texas. A haemagglutinin prepared from infected brains of unweaned mice was inhibited at low titres by antisera for St. Louis encephalitis (SLE), Japanese B encephalitis (JBE) and West Nile encephalitis (WNE) viruses; and at high titres with homologous antiserum. Results of reciprocal c.f. tests are taken to suggest a common antigen with SLE virus but not with other neurotropic viruses—Eastern equine encephalomyelitis (EEE), Western equine encephalomyelitis (WEE), Venezuelan encephalomyelitis (VE), JBE, lymphocytic choriomeningitis and rabies. Neutralization tests revealed that the bat virus was more closely related to Ntaya virus than to WNE, Murray Valley encephalitis, JBE or SLE viruses. Hyperimmune sera against WEE, EEE, VE, lymphocytic choriomeningitis, encephalomyocarditis and rabies did not neutralize the bat virus. It is considered that this virus is probably a distinct entity.—T.E.G.R.

COLTER, J. S., BIRD, H. H., MOYER, A. W. & BROWN, R. A. (1957). **Infectivity of ribonucleic acid isolated from virus-infected tissues.** — *Virology* **4**, 522-532. [Authors' summary modified.] **2133**

Ribonucleic acid preparations, isolated from poliomyelitis virus-infected hamster brain and spinal cord and from Ehrlich ascites tumour cells infected with West Nile encephalitis virus were shown to be infective. The infective components in the ribonucleic acid preparations and the corresponding virus particles were differentiated on the basis of lability to ribonuclease and incubation at 37°, by their behaviour in 1 *M* sodium chloride solution, and by differences in their sedimentation velocities. Poliomyelitis and West Nile viruses were isolated from the brains of mice which died following the intracerebral injection of the corresponding ribo-

nucleic acid preparations, and were identified by means of specific immune sera. Data were presented which indicated that in the case of ribonucleic acid preparations isolated from Mengo encephalitis virus-infected Ehrlich tumour cells, the infective component arose from intact virus particles.

JUNGHERR, E. L. & WALLIS, R. C. (1958). **Investigation of Eastern equine encephalomyelitis. I. General aspects.**—*Amer. J. Hyg.* **67,** 1-3. **2134**

LUGINBUHL, R. E., SATRIANO, S. F., HELMBOLDT, C. F., LAMSON, A. L. & JUNGHERR, E. L. (1958). **Investigation of Eastern equine encephalomyelitis. II. Outbreaks in Connecticut pheasants.**—*Ibid.* 4-9. **2135**

JUNGHERR, E. L., HELMBOLDT, C. F., SATRIANO, S. F. & LUGINBUHL, R. E. (1958). **Investigation of Eastern equine encephalomyelitis. III. Pathology in pheasants and incidental observations in feral birds.**—*Ibid.* 10-20. **2136**

SATRIANO, S. F., LUGINBUHL, R. E., WALLIS, R. C., JUNGHERR, E. L. & WILLIAMSON, L. A. (1958). **Investigation of Eastern equine encephalomyelitis. IV. Susceptibility and transmission studies with virus of pheasant origin.**—*Ibid.* 21-34. **2137**

WALLIS, R. C., JUNGHERR, E. L., LUGINBUHL, R. E., HELMBOLDT, C. F., SATRIANO, S. F., WILLIAMSON, L. A. & LAMSON, A. L. (1958). **Investigation of Eastern equine encephalomyelitis. V. Entomologic and ecologic field studies.**—*Ibid.* 35-45. **2138**

I–V. These five papers give the results of investigations into Eastern equine encephalomyelitis in captive pheasants in Connecticut. 15 outbreaks of the disease in pheasants were recorded between 1951 and 1956. A serological survey revealed antibodies in only 5 out of 193 birds (on 4 of 21 pheasant farms); antibodies persisted for at least 16 months in birds which recovered from natural infection. The virus caused encephalitic lesions with necrosis which more resembled Western encephalitis than Eastern. It was not possible to set up by artificial infection encephalitis in wild birds other than pheasants. Feather picking was an important means of transmitting virus from pheasant to pheasant: the prevention of feather picking by cutting the beaks or applying repellents was a valuable method for controlling spread of the disease. The mosquito population of 14 infected farms included *Culex restuans* and *Aedes triseriatus* but not *Culiseta melanura*.—R.M.

V. SPROCKHOFF, H. (1958). Experimentelle Befunde bei der Bornaschen Krankheit. Untersuchungen über das Borna-s-Antigen und Infektionsversuche mit infantilen Kaninchen. **[Experimental studies on Borna disease: soluble antigen and infection of young rabbits.]**—*Z. ImmunForsch.* **115,** 161-168. [English, French, Spanish and Russian summaries.] **2139**

Complement-fixing Borna antigen was found in the brain of infected animals but not in other organs. Brain from rabbits which did not develop symptoms after repeated inoculation of virus contained c.f. antibody but no soluble antigen. The soluble antigen retained its c.f. activity at least 1 or 2 days at pH 5–8 at room temp. or 19 weeks at 2°C. Centrifugation for an hour at 145,000 g. caused about half the soluble antigen to sediment: its size was between 15 and 30 mμ.

Rabbits aged 2–5 days were fully susceptible to s/c and i/p infection. The incubation period after intracerebral infection was 2–3 times longer than normal. Infection developed in one of 3 rabbits given virus by mouth. [See also *V.B.* **25,** 4028; **28,** 757.]—R.M.

MCKERCHER, P. D. (1957). **Rinderpest virus adapted to the chorio-allantoic membrane of the chick embryo. Its attenuation and use as a vaccine.**—*Canad. J. comp. Med.* **21,** 374-378. **2140**

While the virus of rinderpest had been successfully propagated on the developing chick embryo and attenuated through serial passages, the seed virus used in the production of vaccine at the Grosse Isle Experimental Station during the second world war was eventually lost. The present report covers the successful adaptation of the Kabete strain of rinderpest virus to the chorio-allantoic membrane of the chick embryo and the propagation of the virus without difficulty. Virulence of the virus disappeared after some 40 serial egg passages, but the non-pathogenic form of virus continued in further passages induced immunity without evidence of infection other than an occasional slight temperature elevation. The concentration of virus in the membranes and fluids from one egg was sufficient to immunize at least 200 cattle.

—R. V. L. WALKER.

NAKAMURA, J., MOTOHASHI, T. & KISHI, S. (1958). **Propagation of the lapinized-avianized strain of rinderpest virus in the culture of chicken embryo tissue.**—*Amer. J. vet. Res.* **19,** 174-180. [Authors' summary modified.] **2141**

The lapinized-avianized strain of rinderpest

virus was successfully propagated in chick embryo tissue culture. A simple suspension method similar to that described by Maitland gave satisfactory results. Various culture conditions were studied for the establishment of a standard culture method. As a result of virus propagation, specific c.f. antigen developed in the cultured tissue. Although this antigen was probably not the same entity as the infective virus, its demonstration provided a reliable means of diagnosis. The tissue culture method, in conjunction with the c.f. test, appeared to be somewhat less sensitive than egg-inoculation in detecting a minute amount of virus. Nevertheless, the method was reliable for the determination of a relative titre of the virus. This technique was also effectively applied to the virus-neutralization test.

HARSHFIELD, G. S. (1957). **Sporadic bovine encephalomyelitis.** — *Tech. Bull. S. Dak. agric. Exp. Sta.* No. 18, pp. 17. **2142**

H. discussed present knowledge of this disease. In South Dakota 175 cases were seen between 1945 and 1956 and about half the affected cattle died. There are 6 photomicrographs of brain lesions. [See also *V.B.* **27,** 1755.]—R.M.

JARRETT, W. F. H. (1958). **British mucosal disease.**—*Vet. Rec.* **70,** 48-50. **2143**

In Britain, the condition affecting cattle which has come to be known as "mucosal disease" and is characterized at some stage by buccal ulceration, a febrile response, a leucopenia and a diarrhoeic syndrome, has a very high percentage morbidity. Most cases are very mild, exhibiting only a few small buccal vesicles, ulcers or a winter scour type of syndrome; only a few severe, frequently fatal, cases are recognized. Winter scour is a different condition. The disease has an incubation period of 7–9 days and can be transmitted experimentally by most routes using bacteria-free suspensions of spleen, blood or faeces of affected animals. Resistance to further challenge does not occur until 40 days after infection whilst repeated ulcer formation can continue for two months.—A. ACKROYD.

MANSJOER, M. (1957). **Contribution to the knowledge of the "Penjakit ingusan" of cattle and buffaloes in Indonesia, especially on the Island of Lombok.** — *Thesis, Bogor.* pp. 190. [Author's summary (in English) in *Commun. vet. Bogor.* **1,** 39-48. Summaries in French, German and Indonesian.] **2144**

In a monograph of 190 pages M. deals with the pathology, virology and epidemiology of an acute disease of cattle and buffaloes in Indonesia which resembles bovine malignant catarrh and snotziekte, although cross immunity tests with the agents of these diseases have not yet been carried out. The rabbit can be infected experimentally and the infective agent is stated to multiply on the chorioallantois of the developing chick embryo. The virus passes Seitz EK filters and can be found in the blood, brain, lymph nodes and internal organs of affected animals. Immunity after an attack of the disease is incomplete. Doses of 100–500 ml. of blood are required to infect susceptible cattle.

—E. G. WHITE.

LIVINGSTON, C. W. & HARDY, W. T. (1957). **Vaccination of suckling lambs with bluetongue vaccine.**—*Sthwest. Vet.* **11,** 27-28. [Authors' summary copied *verbatim.*] **2145**

A satisfactory immunity against bluetongue was not produced by inoculating unweaned lambs with a commercial vaccine which had previously been shown to be satisfactory in older animals. Lambs should not be vaccinated for bluetongue until a period of 2 weeks or longer has elapsed following weaning.

VON ZEIPEL, G., SVEDMYR, A., HOLMGREN, B. & LINDAHL, J. (1958). **Tick-borne meningoencephalomyelitis in Sweden.** — *Lancet* January 11th, 104. **2146**

Neutralizing antibodies against louping-ill virus were found in the convalescent sera of 66 out of 159 patients with the clinical diagnosis of aseptic meningitis, meningoencephalitis or poliomyelitis. About 70% of them reported that they had been bitten by ticks within a fortnight before symptoms developed. The clinical picture corresponded with that of Central European tick-borne encephalitis. Neutralizing antibodies were not found in 44 healthy blood donors.

—M.G.G.

KASCHULA, V. R. (1957). **Rift Valley fever as a veterinary and medical problem.**—*J. Amer. vet. med. Ass.* **131,** 219-221. **2147**

The transmission, pathology and incidence of Rift Valley fever in Africa are described. Since the vectors are already present in the U.S.A. the disease could spread if the virus were introduced at a favourable time and place. Infected lambs and calves have a high death rate; only two fatal cases in man have been recorded.—E.V.L.

GORDON, W. S. & PATTISON, I. H. (1957). **The experimental production of scrapie in goats.** —*Vet. Rec.* **69,** 1444. **2148**

Scrapie was passaged in series through 3 groups of goats following initial transmission to goats by intracerebral inoculation of brain tissue

from an affected sheep. There was 100% "take" but the disease took from 7 to 22 months to develop. Only 8 of 20 South Scotland Cheviot sheep similarly inoculated developed classical symptoms of the disease.—A. ACKROYD.

ROGER, F. & ROGER, A. (1958). Le virus de l'avortement de la brebis. Son pouvoir pathogène pour le névraxe. Sa parenté avec le virus lymphogranulomateux. **[The virus of ovine abortion. Its pathogenicity for the nervous system and its relationship to lymphogranuloma virus.]**—*Ann. Inst. Pasteur* **94,** 379-383. [English summary copied *verbatim.*] **2149**

The virus of sheep abortion possesses a marked affinity for the central nervous system. Its pathogenicity in mice as in monkeys is similar to that of the classical strains of lymphogranuloma virus. Mice are much more resistant than monkeys. After inoculation into the arachnoid, they present a prolonged chronic disease, even when very high doses of virus are used. Although this disease is often very well tolerated, a very slow multiplication of the virus takes place. Monkeys inoculated with considerable doses of sheep abortion virus present an exceptionally acute, often hypothermic disease; the meningeal symptoms are accompanied by symptoms of irritation of the nuclei of the basal region of the brain and cerebellum. Although the course of the disease was very rapid, it was possible to demonstrate an abundant multiplication in the arachnoid.

BUGYAKI, L. (1957). La "maladie de Kisenyi" du mouton. Immunité et traitements. **["Kisenyi disease" of sheep. Immunity and treatment.]** —*Bull. agric. Congo belge* **48,** 697-702. [Flemish summary.] **2150**

Sheep in areas free from the disease were susceptible, regardless of age, sex and breed. Recovered animals were resistant to re-infection and lambs born to recovered ewes appeared to acquire a passive immunity through the colostrum. The disease could be reproduced by s/c inoculation of susceptible animals with blood from an animal in the febrile stage of the disease. Formolized vaccine failed to protect against natural infection. Penicillin, aureomycin and various sulphonamides had no specific action on the causal organism; but sulphaguanidine may be used symptomatically to alleviate the gastro-enteritis. [See also *V.B.* **26,** 2293.]
—H. SCOTT MCTAGGART.

HÉJJ, L. & SZABÓ, I. (1957). A sertéspestisnek Bact. pyosepticum okozta vérfertőzéssel szövődött alakja. **[Swine fever complicated by *Bact. viscosum* infection.]**—*Mag. állator. Lapja* **12,** 391-392. [In Hungarian. English and Russian summaries.] **2151**

Among seven pigs (in adjacent sties) which were found to be infected with swine fever, three also had *Bact. viscosum* septicaemia. Two similar cases were observed in a herd which was infected with swine fever and acute (*Salmonella cholerae-suis* var *kunzendorf*) paratyphoid. The authors consider that if *Bact. viscosum* septicaemia is observed, swine fever should be suspected as the primary disease.—A. SEBESTENY.

MARKOVITS, P. & BIRÓ, J. (1957). Kísérletek a sertéspestisvírus elszaporítására szövettenyészetben. III. Szövettenyészetben fenntartott sertéspestis-vírustörzs virulenciaváltozása. **[Cultivation of swine fever virus in tissue culture. III. Effect on virulence.]**—*Mag. állator. Lapja* **12,** 347-350. [In Hungarian. English and Russian summaries.] **2152**

Washington and Jen-Sal (American) and Phylaxia (Hungarian), swine fever virus strains were cultivated in tissue cultures and the virulence and immunizing effect of the virus after each passage studied in pigs [no details]. The Washington strain showed only a slight but continuous decrease in virulence from the 60th to the 137th passages, which was mainly manifested in the increased duration of the disease. 6 of 23 pigs inoculated with virus from the 87–137th passages survived and proved immune against challenge.

The Phylaxia strain needed the insertion of a pig passage by the 20th passage when a similar decrease of virulence commenced, which became marked and permanent from the 66th passage: 51 out of 65 pigs inoculated with virus from the 66th–133rd passages survived (78·5%) and 50 of them proved immune against artificial infection.

6 pigs inoculated with virus from the 78–85th passages developed immunity after a marked rise in temp. No side reaction was observed, however, in 6 other pigs given swine fever serum simultaneously with the virus and immunization was equally successful.

The Jen-Sal strain also needed the insertion of a pig passage by the 13th passage.
—A. SEBESTENY.

KÁDÁR, T., KÖVES, J., MANNINGER, R. & ŐSZ, G. (1957). Kísérletes vizsgálatok a sertéspestis lapinizált vírusának védőoltásra való használhatóságáról. **[Experimental study on lapinized swine fever virus vaccine.]**—*Mag. állator. Lapja* **12,** 201-206. [In Hungarian. English and Russian summaries.] **2153**

Lapinized swine fever vaccine produced by

Phylaxia, Budapest, showed no change in the immunizing effect through nine passages with 5, 6 and 7 days' intervals in 30 Large White pigs of 35–60 kg. 290 pigs of 23–30 kg. received in three groups: A. Phylaxia vaccine only; B. vaccine with 10 ml. serum; C. vaccine with 20 ml. serum. 10 pigs of each group were transported and infected on the 6th, 10th, 30th and 92nd days after inoculation and all proved immune against the virulent virus. However, 4 in each group on the first, and 6, 1 and 4 (A, B and C) respectively on the second occasion, died by the rapid increase in relative susceptibility to the lapinized virus from the upset of transportation. 20 controls were left uninoculated in each group. They became immune in groups A and B obviously as a result of virus excretion by their mates. This did not happen in group C, where the immunization also proved most satisfactory, therefore the procedure applied to this group is suggested for general routine.—ANDREW SEBESTENY.

BIRÓ, J. & OLÁH, P. (1957). Kísérletek a nyúlhoz szoktatott sertéspestisvirussal. **[Lapinized swine fever virus.]** — *Mag. állator. Lapja* **12,** 206-210. [In Hungarian. English and Russian summaries.] **2154**

I/v injection of 2 ml. of lapinized swine fever vaccine resulted in a rise in temperature, enlargement of the spleen with 10^{-7} virus titre and immunity after 30 days, in 85–90% of rabbits of 2–2½ kg.

2 ml. of 50 times diluted spleen suspension from these rabbits was given i/m to 143 pigs of 42 kg. in three groups. Of the 67 pigs of the first group (vaccine without serum) one died with typical swine fever symptoms, one failed to develop immunity and 24 responded with a temperature of 40°C.; virus excretion was observed. The 38 pigs in each of the second and third groups, which received swine fever serum simultaneously in 10 and 20 ml. doses respectively, all developed immunity with one exception in the third group, without either side-reaction or observable virus excretion.

After 5 passages in pigs of 35–45 kg. the virus showed no change in virulence.

The immunity in 8 pigs was proved to be complete on the fifth day after inoculation.

2 ml. vaccine with 15–20 ml. serum conferred immunity without any side-reaction to 161 pigs of 34 kg., 140 pigs of 36 kg. and 150 pigs of 30 kg.—ANDREW SEBESTENY.

DETRAY, D. E. (1957). **Persistence of viremia and immunity in African swine fever.** — *Amer. J. vet. Res.* **18,** 811-816. [Author's summary modified.] **2155**

Eight pigs, which survived for 86–456 days after exposure to African swine fever, had persistent viraemia which was demonstrated by subinoculating susceptible pigs. Protective antibodies were demonstrated in the serum of 2 pigs 27 and 33 days, respectively, after exposure, but could not be demonstrated thereafter although the viraemia remained. Two pigs had viraemia without clinical symptoms. Domestic pigs, as well as wart-hogs and bush pigs, may become carriers of this disease. Killed vaccines failed to induce immunity. Resistance to reinfection may depend on a persisting infection rather than on circulating antibodies.

I. SCHWÖBEL, W. (1957). Die Züchtung des Virus der ansteckenden Schweinelähmung (Teschener Krankheit) in Nierengewebekulturen vom Schwein und Charakterisierung des Kulturvirus. I. Teil: Ansatz und Behandlung der Gewebekulturen. **[Cultivation of the virus of Teschen disease in pig kidney tissue cultures and properties of the cultured virus. I.]**—*Zbl. Bakt. I. (Orig.)* **168,** 329-335. [English, French and Russian summaries.] **2156**

II. MAYR, A. & SCHWÖBEL, W. (1957). Die Züchtung des virus der ansteckenden Schweinelähmung (Teschener Krankheit) in Nierengewebekulturen vom Schwein und Charakterisierung des Kulturvirus. II. Teil: Anzüchtung, Verhalten und Vermehrung verschiedener Gehirnvirusstämme in der Gewebekultur. **[Cultivation of the virus of Teschen disease in pig kidney tissue cultures and properties of the cultured virus. II.]**—*Ibid.* 336-349. [English, French and Russian summaries.] **2157**

III. MAYR, A. (1957). Die Züchtung des Virus der ansteckenden Schweinelähmung (Teschener Krankheit) in Nierengewebekulturen vom Schwein und Charakterisierung des Kulturvirus. III. Teil: Weitere Charakterisierung des Kulturvirus. **[Cultivation of the virus of Teschen disease in pig kidney tissue cultures and properties of the cultured virus. III.]**—*Ibid.* 350-359. [English, French and Russian summaries.] **2158**

I. The tissue culture technique employed was based on established methods. The medium used for culturing pig kidney cells was unsuitable for culturing the virus: before inoculation of virus, the medium was replaced by bovine amniotic fluid, in which 3 strains of Teschen disease virus grew well.

II. The first sign of cell damage by the virus was rounding of the cells and this was followed by lysis (8 photomicrographs). Max-

imum virus titre was attained during the first third of the period of cell destruction; it appeared that virus was released before pycnotic and lytic changes occurred in the cells. Virus titre increased with passage of the virus for up to 50 passages.

III. Cultured virus remained infective for pigs by the intracerebral route during 50 passages. When administered by mouth it was more infective for pigs than virus passaged in brain; it was thought to resemble more closely the virus occurring in the field. Cultured virus administered by mouth or parenterally immunized pigs against brain-passaged virus. Neutralization tests in tissue culture were superior to tests in pigs. There was no cross-neutralization between the viruses of Teschen disease and poliomyelitis, swine fever or Aujeszky's disease. Cultured virus in bovine amniotic fluid was relatively resistant to heat and cold.—R.M.

CHAPRONIERE, D. M., DONE, J. T. & ANDREWES, C. H. (1958). **Comparative serological studies on Talfan and Teschen diseases and similar conditions.**—*Brit. J. exp. Path.* **39,** 74-77. [Authors' summary modified.] **2159**

A virus causing paralysis of pigs in Britain (Talfan disease) was propagated in cultures of pig kidney and reproduced the disease in pigs when inoculated intracerebrally. Talfan disease virus was neutralized by sera active against strains of Teschen disease virus from Czechoslovakia, Sweden and Germany; also by sera from a case of enzootic ataxia in Britain and of "poliomyelitis suum" in Denmark. Immune sera against all 3 types of human poliomyelitis virus failed to neutralize it. A strain of Teschen disease virus from Germany was neutralized by Talfan disease immune sera. The virus of Talfan disease thus appears to be closely related to or identical with that of Teschen disease.

DINTER, Z., WESSELÉN, T. & LANNEK, N. (1957). Die Kultivierung des SEP-Agens im Dottersack des Bruteies. **[Cultivation of the agent of porcine enzootic pneumonia in the yolk sac of incubated eggs.]**—*Zbl. VetMed.* **4,** 582-587. [English, French and Spanish summaries.] **2160**

The agent previously isolated by the authors and maintained in tissue culture [*V.B.* **25,** 107; **27,** 2082] was cultivated in chick embryos by inoculation into the yolk sac on the 5th–7th days of incubation. This method could be used for isolating the agent from infected lungs.—R.M.

GOODWIN, R. F. W. & JENNINGS, A. R. (1958). **A highly infectious disease of pigs in East Anglia.**—*Vet. Rec.* **70,** 111. **2161**

An afebrile but highly infectious disease characterized by enteritis occurs in pigs in East Anglia. Mortality is high in piglets less than 3 weeks old and the disease affects pigs vaccinated against swine fever. The disease can be transmitted by bacteriologically sterile supernatant fluid from centrifuged suspensions of brain and intestinal contents of affected animals and appears similar to the serious epizootic transmissible gastro-enteritis in the U.S.A.

—A. ACKROYD.

TEUNISSEN, G. H. B., BOSGRA, O. & WILSON, J. H. G. (1957). Praktijkervaringen met levend, avirulent hondeziektevirusvaccin. **[Experience with live avirulent distemper virus vaccine.]**—*Tijdschr. Diergeneesk.* **82,** 493-506. [In Dutch. English, French, German and Spanish summaries.] **2162**

Results of inoculation of 584 dogs confirmed previous reports of the high efficacy of egg-adapted distemper virus vaccine.—R.M.

FONTAINE, M. (1957). Le diagnostic de la maladie de Rubarth par sero-précipitation. **[Diagnosis of canine virus hepatitis by a precipitation test.]**—*Rev. Path. gén.* **57,** 941-944. Discussion: pp. 944-946. [English and Spanish summaries.] **2163**

Gel precipitation, according to the technique described by Oudin and by Ouchterlony, was an accurate and sensitive test for the diagnosis of canine virus hepatitis.—T.E.G.R.

OLÁH, P. (1957). Passzív és aktív immunizálás a kutyák fertőző májgyulladása (Rubarth-kór) ellen. **[Immunization of dogs against infectious virus hepatitis.]** — *Mag. állator. Lapja* **12,** 377-380. [In Hungarian. English and Russian summaries.] **2164**

Immune serum against canine virus hepatitis was prepared by hyperimmunizing dogs with i/v and i/p injections of the virus. This serum proved superior to bivalent serum against both distemper and virus hepatitis: the monovalent serum in a dose of 0·5 ml./kg. body wt., and the bivalent serum in a dose of 1·5 ml./kg. protected dogs against s/c injection of 10^5 M.I.D. of the virulent virus. A parallel was observed between the complement-fixation titre and the potency. The monovalent serum given in doses of 3 ml./kg. to 7 puppies (2–3 months old) 24 hours after an artificial infection, prevented the manifestation of the disease, and cured 5 out of 7 other puppies when given 48 hours after infection.

Vaccine prepared from inactivated virus was given s/c to 35 puppies (2–4 months old) in doses of 2 ml. Only 4 responded with temperature rise; 11 of them after three weeks and 4 after four months were artificially infected and all proved immune against canine virus hepatitis. —A. SEBESTENY.

FASTIER, L. B. (1957). **Production of a haemagglutinin during growth in tissue culture of infectious canine hepatitis virus.** — *Nature, Lond.* **179,** 420-421. **2165**

F. described a shield type haemagglutination reaction produced by tissue culture propagated virus. Culture fluid at pH 8·0 with 0·02 M phosphate buffer caused agglutination at 0·25% suspension of erythrocytes. These culture fluids were harvested after 3–4 days when cytopathogenic changes were at maximum. Only erythrocytes of newly hatched chicks and older fowls were specifically agglutinated by this virus. Haemagglutination was specifically inhibited by immune dog serum in a dilution 1:320–1:640. Apart from slight non-specific inhibition in dilutions lower than 1:10, normal dog sera did not possess this property.—W. MANSI.

MIYAZAKI, Y., KATSUTA, H., AOYAMA, Y., KAWAI, K. & TAKAOKA, T. (1957). **Experimental studies on hepatitis virus of mice in tissue culture.**—*Jap. J. exp. Med.* **27,** 381-399. [In English.] **2166**

Mouse hepatitis virus was successfully propagated in tissue culture of mouse liver cells and was passaged through 94 generations in 194 days. Cellular degeneration with karyolysis and necrosis were observed in infected cultures. —R.M.

CHAPRONIERE, D. M. (1957). **The effect of age on the susceptibility of rat tissues to myxoma virus in culture.** — *Virology* **4,** 393-403. [Author's summary modified.] **2167**

Tissues from embryonic and new-born rats in culture were more susceptible to myxoma virus than those of older animals. This phenomenon was not linked with the known changes in cell populations, cell permeability, production of inhibitors or lack in older tissues of any factor which could be supplied by extracts of embryonic tissue. The possible relationship of this phenomenon to changes in cell metabolism consequent on aging was discussed.

WINTERFIELD, R. W., GOLDMAN, C. L. & SEADALE, E. H. (1957). **Newcastle disease immunization studies. IV. Vaccination of chickens with B1, F and LaSota strains of Newcastle disease virus administered through the drinking water.**—*Poult. Sci.* **36,** 1076-1088. [For previous parts, see *V.B.* **26,** 2313; **28,** 443.] **2168**

The conc. of strain F virus in drinking water required to produce immunity was similar to that of strain B1. The "La Sota" strain stimulated high antibody titres at a lower conc. in the drinking water and provided good protection from mortality and nervous complications, but respiratory infection with Newcastle disease virus developed more often after immunization with low concentrations of vaccine than with high conc. in drinking water.—R.M.

RUSSEFF, C. & MITEFF, G. (1957). La vaccinazione contro la pseudopeste dei polli per aerosol e per via orale in Bulgaria. **[Immunization of fowls in Bulgaria against Newcastle disease with aerosol and oral vaccines.]** —*Zooprofilassi* **12,** 920-925. **2169**

In chicks and adult birds vaccinated by aerosol there was evidence of immunity on the 5th day. Oral administration by adding the vaccine to the drinking water was convenient and practical for mass immunization. It conferred immunity towards the 7th–8th day and did not cause undesirable effects. Chicks hatched from eggs of immunized hens were resistant, for the first few weeks of life, to challenge by the nasal route but were susceptible to infection by the intramuscular route. The vaccine administered in the drinking water retained its haemagglutinating titre for, at least, 7 hours.—T.E.G.R.

RUBIN, H. (1957). **Interactions between Newcastle disease virus (NDV), antibody and cell.**—*Virology* **4,** 533-562. [Author's summary modified.] **2170**

An account of a quantitative study of the inactivation by antibody of the infectivity and enzymic activity of Newcastle disease virus and of the role played by cells in this inactivation.

By use of P^{32}-labelled virus, the enzyme, measured by the capacity of virus to elute from r.b.c., was shown to be inactivated according to first order kinetics. Repetition of the adsorption-elution cycles showed that there were multiple enzyme sites on the virus. R. described a method for determining the number of enzyme sites per virus particle. The fraction of virus which remains infective after antibody treatment largely retains its infectivity when firmly adsorbed to cells. On the other hand fully infective untreated virus loses its infectivity upon firm adsorption. This observation leads to the conclusion that there is more than one site per virus particle at which inactivation by antibody can occur. None of the sites is critical in the sense that inactivation of no single site determines,

a priori, that the particle is inactive. Calculation from these data of the number of "infectivity" sites agrees in magnitude with the calculated number of enzyme sites which was derived by an independent technique. Evidence was presented that reactivation of virus–antibody complexes could occur on the surface of the cell. This reactivation could be blocked if serum was present in the medium. The relevance of these findings to various theories of antibody inactivation and cell penetration was discussed. [See also *V.B.* **27**, 1778.]

SCATOZZA, F. (1957). Ricerche sugli anticorpi verso il virus di Newcastle in sieri di soggetti umani normali. **[Antibodies against Newcastle disease virus in human serum.]**—*Vet. ital.* **8**, 667-675. [English, French and German summaries.] **2171**

Of 1,363 samples of human serum from the Perugia, Milan and Rome districts, 13 contained haemagglutination-inhibiting and complement-fixing antibodies against Newcastle disease virus. —T.E.G.R.

SØNDERGAARD, E. & VOLKERT, M. (1957). **Ornithosis complement fixing antigen from infected allantoic fluid.**—*Acta path. microbiol. scand.* **41**, 421-425. [In English. Authors' summary modified.] **2172**

Investigation of the antigen content of psittacosis infected allantoic fluid revealed a corpuscular antigen insoluble in ether and saline, with qualities similar to those of the virus antigen in the yolk sac. It had no advantage over the yolk sac antigens in the complement-fixation test. Yolk sac antigens were superior only because of the much higher yield of antigen from the yolk sac.

CHRISTENSEN, P. M. (1957). **Ornithosis : A study of virus and antigen.**—*Acta path. microbiol. scand.* Suppl. 118. pp. 110. [In English. Danish summary.] **2173**

A survey of clinical data and epidemiology of psittacosis is followed by studies of size and morphology of the virus, its cultivation in mice and eggs, and staining technique of elementary bodies. Methods of antigen production and the physical properties of the antigen are given in great detail.—E.V.L.

NEAL, J. E. & DAVIS, D. E. (1958). **A comparison of the indirect complement-fixation test, the direct complement-fixation test, and the macroscopic-agglutination test for ornithosis antibodies in turkey serums.**—*Amer. J. vet. Res.* **19**, 200-203. [Authors' summary modified.] **2174**

Serum samples from 923 turkeys were tested for psittacosis antibodies by the macroscopic-agglutination test, the indirect c.f. test, and the direct c.f. test. The correlation between the results of the agglutination test and the indirect c.f. test was 42·3%, and between the results of the agglutination test and the direct c.f. test 40·4%. The two c.f. tests gave similar results with 85·1% of the sera. Some turkeys initially negative to the indirect c.f. test gave a positive reaction three months later without showing clinical evidence of infection.

PROVOST, A. (1957). Identification au Tchad d'un virus du groupe des chlamydozoacées, pathogène pour la chèvre. (Note préliminaire.) **[A virus of the psittacosis-lymphogranuloma group pathogenic for goats in Africa.]**—*Rev. Elev.* **10**, 113-117. [English and Spanish summaries.] **2175**

High mortality, usually without clinical manifestations other than a characteristic febrile reaction, occurred among goats kept for the production of rinderpest virus. The temperature of affected animals rose rapidly from 37°C. to 41° then dropped to 38·5° and rose again to 40·5°. The course was 36–48 hours. In some cases there were respiratory symptoms with a muco-purulent discharge and dulness. P.M. findings included: oedema and congestion of the lungs with scattered foci of pneumonia, mainly in the apical lobes; thick, frothy mucus in the trachea and bronchi; congestion of the intestines; peritoneal exudate; and glomerular nephritis. A virus having the morphological and serological characteristics of the psittacosis–lymphogranuloma group was isolated from the lungs of affected animals.—T.E.G.R.

OLSON, N. O., SHELTON, D. C. & MUNRO, D. A. (1957). **Infectious synovitis control by medication—effect of strain differences and pleuropneumonia-like organisms.**—*Amer. J. vet. Res.* **18**, 735-739. **2176**

Nine unidentified infectious agents and two strains of P.P.L.O. were isolated from fowls with infectious sinusitis in 7 flocks. Experiments on the susceptibility to the isolated agents of chicks given chlortetracycline (200 g./ton) or furazolidone (200 g./ton) in the food revealed that the latter was ineffective but chlortetracycline was effective against all except two agents.—R.M.

WHITMIRE, C. E. (1957). **Effects of cortisone on experimental murine typhus. I. Susceptibility of the Syrian hamster to murine typhus and the effect of cortisone.**—*J. Bact.* **74**, 417-424. **2177**

WHITMIRE, C. E. & DOWNS, C. M. (1957). **Effects of cortisone on experimental murine**

typhus. II. Effect of cortisone on the comparative susceptibility of laboratory animals to infection with murine typhus.—*Ibid.* 425-431. **2178**

DOWNS, C. M. & WHITMIRE, C. E. (1957). **Effects of cortisone on experimental murine typhus. III. Effect of cortisone on the immune response in mice, rabbits, and guinea pigs.**—*Ibid.* 432-438. **2179**

I. Ten day old hamsters succumbed to i/p infection with *Rickettsia typhi* whereas those over 18 days old were resistant. Although hamsters aged 4 weeks showed no signs of infection the rickettsia multiplied in their tissues and could be recovered 24 days after infection. Adult male hamsters developed a scrotal reaction to infection. Cortisone increased the susceptibility of hamsters to murine typhus and transformed latent into fatal infections 24 days after initial infection. Continued treatment suppressed the scrotal reaction, but brought about fatal infection.

II. The mouse was the most susceptible to murine typhus followed by the cotton rat. No deaths occurred in g.pigs or hamsters but g.pigs were more sensitive in developing the scrotal reaction. After cortisone treatment the hamster was the most susceptible to fatal infection followed by the mouse and cotton rat. Cortisone did not bring about fatal infection in the g.pig. Cortisone altered the course of infection in the hamster and g.pig. The scrotal reaction was suppressed in the hamster, but suppression in the g.pig was related to the strength of the infective dose, complete suppression occurring when the infective dose was small. The relation of cortisone interference with the inflammatory reaction and the scrotal reaction in the g.pig was demonstrated with trypan blue. Aheat-stable haemagglutination - inhibition antigen was demonstrated in all animals dying from typhus.

III. Cortisone had no effect on the development of immunity or on the resistance to challenge with murine typhus in mice, or on the immunization of rabbits with sonic treated or whole rickettsial antigens.—M.G.G.

See also absts. **2263** (Q fever and brucellosis antibodies in sheep serum); **2372** (C.S.I.R.O. report, Australia); **2373** (report, Uganda).

IMMUNITY

I. AUGUSTIN, R. (1957). **Fundamental aspects of single versus double diffusion methods for immunological assays.**—*Int. Arch. Allergy* **11**, 153-169. **2180**

II HAYWARD, B. J. & AUGUSTIN, R. (1957). **Quantitative gel diffusion methods for assay of antigens and antibodies.**—*Ibid.* 192-205. [Authors' summaries modified.] **2181**

I. The "gradient" double diffusion method of Augustin & Hayward (1955) was compared critically with the "simple" double diffusion method of Oakley & Fulthorpe (1953) and the single diffusion method of Oudin (1946). Reasons for the greater sensitivity of the gradient method were pointed out. Theories describing antigen–antibody behaviour in single and double diffusion methods were discussed and attempts were made to elucidate the mechanism of reaction in the gradient diffusion method.

II. Adaptations of the authors' original gradient gel diffusion method [*Int. Arch. Allergy* **6**, 154 (1955)] were given for the assay of antibodies and quantities of antigens of 1 μg./ml. Two semi-quantitative gel plate methods for assaying antigens and antibodies were described. Methods for staining and preserving antibody gel diffusion patterns were given.

WILLIAMS, R. R. & STONE, S. S. (1957). **Application of antigen-antibody reactions on supporting media to the purification of proteins. I. A model system using bovine serum albumin and bovine γ-globulin.** — *Arch. Biochem.* **71**, 377-385. **2182**

The general procedure was to adsorb crystalline bovine serum albumin on cellulose. Antiserum reacts with the adsorbed albumin and the non-antibody protein is carefully eluted from the cellulose by washing with a buffer soln. The cellulose, with antigen and antibody adsorbed, is then passed through an absorbent column. This removes serum albumin but not gamma-globulins.—R.M.

ASKONAS, B. A. & HUMPHREY, J. H. (1958). **Formation of specific antibodies and γ-globulin *in vitro*. A study of the synthetic ability of various tissues from rabbits immunized by different methods.**—*Biochem. J.* **68**, 252-261. [Authors' summary modified.] **2183**

Incorporation of [^{14}C] amino-acids into specific antibody and other γ-globulin *in vitro* by tissue slices from immunized animals occurred at a constant rate for a few hours after a short lag period provided that the cells were undamaged. After mild damage no incorporation into secreted proteins occurred, although insoluble tissue proteins still became labelled. Procedures which broke up the cells prevented incorporation of added amino-acids into specific protein.

Incorporation of the radioactive carbon into antibody was due to synthesis and secretion of antibody by the tissue slices. By comparing the rates of incorporation of [^{14}C] glycine or valine *in vitro* by different tissues from rabbits immunized by different routes, it was possible to assess the relative contributions of these tissues to overall synthesis of specific antibody and other γ-globulin in the whole animal. Rabbits immunized by i/m injection of ovalbumin in Freund's adjuvant mixture synthesized most of their antibody in the local granuloma, but, after further i/v inj. of alum-precipitated antigen, the spleen, lung and bone marrow became important sites of synthesis. When ovalbumin or pneumococci, or both, were injected i/v the bone marrow, or in some animals the lungs, made most of the antibody. In rabbits immunized simultaneously with two different antigens, tissues varied considerably in their ability to synthesize each kind of antibody. Tissues stimulated to produce specific antibody also produced increased amounts of other γ-globulin which was not identified as specific antibody.

Bliss, J. Q., Stewart, P. B. & Fuller, J. L. (1958). **The selective cutaneous response to autologous and non-autologous plasma in dogs: observations on the effects of inbreeding and of immaturity.**—*Brit. J. exp. Path.* **39,** 30-36. [Authors' summary modified.] **2184**

Mongrel dogs react with an increase in local capillary permeability on first exposure to intradermally injected plasma from other (adult) dogs, but do not react to injection of their own plasma. This phenomenon was investigated in partially inbred dogs of standard pure breeds. Among 38 pairs of such animals, many of which were closely related, all responded to non-autologous plasma, but not to autologous plasma. The degree of individual specificity exhibited by dog plasma is therefore extreme. Plasma from mongrel puppies, in contrast, often failed to produce typical responses.

Stevens, K. M., Pietryk, H. C. & Ciminera, J. L. (1958). **Acquired immunological tolerance to a protein antigen in chickens.**—*Brit. J. exp. Path.* **39,** 1-7. [Abst. from survey of paper (p. i).] **2185**

The authors studied the immunological response of chicks hatched from eggs that had been injected in the yolk or extra-allantoically with soluble human serum albumin. Although complete tolerance was not found, the responses were smaller than in control chicks. Attempts to correlate time of inoculation, sex, age and body weight were made. Results were better when the antigen was injected extra-allantoically.

Cinader, B. & Pearce, J. H. (1958). **The specificity of acquired immunological tolerance to azo proteins.**—*Brit. J. exp. Path.* **39,** 8-29. [Survey of paper (p.i) modified.] **2186**

The authors studied the acquisition of tolerance by the rabbit to various azo-proteins and in particular whether tolerance is directed towards the protein or azo moiety. Tolerance to azo human albumin was conferred by a number of injections beginning within 12 hours of birth and the survival of human albumin in these animals was increased. One animal tolerant to human albumin responded to the azo-protein with antibody directed primarily against the modified determinants. Animals injected at birth with azo rabbit serum or azo ribonuclease gave the same antibody titres to azo human albumin as controls but in those pre-injected with azo ribonuclease the antibody was slightly less well-adapted to the modified determinants.

Weigle, W. O. & Maurer, P. H. (1957). **The effect of chemical and physical treatments of sera on the hemolytic activities and fixation of complement nitrogen by antigen-antibody precipitates.** — *J. Immunol.* **79,** 370-383. [Authors' summary modified.] **2187**

Little relationship was found between the amount of complement nitrogen contributed to specific precipitates and either the haemolytic activity of sera or the components of complement present. It was confirmed that the component probably responsible for the contribution of nitrogen to immune precipitates was C'1.

Versene and cation exchange resin either decreased or inhibited the contribution of nitrogen by g.pig and human sera, but had little effect on either the contribution of nitrogen or the precipitation of soluble antigen–antibody complexes, by rabbit serum. Urea reversibly inactivated the components of complement, the haemolytic activity and contribution of nitrogen being either completely or partially inhibited. Almost complete restoration of complement activity of the sera occurred after removal of the urea by dialysis.

Pennell, R. B., Rothstein, F., Surgenor, D. M., Eyquem, A. & Todd, E. W. (1957). **Isolation of properdin from human plasma.** —*Proc. Soc. exp. Biol., N.Y.* **96,** 273-277. [Authors' summary modified.] **2188**

Methods were presented for the isolation of properdin from plasma, collected through a cationic exchange resin or in acid–citrate–glucose soln. by the zymosan adsorption technique described by Pillemer *et al.* (1956). Preliminary data suggested that properdin could be recovered from Cohn Fraction I without the use of zymosan.

KNILL, L. M., PODLESKI, T. R. & CHILDS, W. A. (1958). **Normal values of swine serum proteins.**—*Proc. Soc. exp. Biol., N.Y.* **97,** 224-226. [Authors' summary modified.] **2189**

Zone electrophoretic examination of sera from a large, random selection of apparently healthy slaughter pigs yielded statistically valid protein concentrations. Only albumin and alpha, beta, and gamma globulin were resolved and quantitated by this method. The "f" fraction described by Deutsch & Goodloe (1945) and $alpha_1$ globulin are discernible only under specific conditions, the ionic strength, the pH of the buffer and apparently the separating medium influencing their resolution.

MATHEWS, J. & BUTHALA, D. A. (1958). **Toxicity of heated swine serum.**—*Amer. J. vet. Res.* **19,** 32-36. [Authors' summary modified.] **2190**

Increasing the temperature for heat treatment of swine serum increased the amount of albumin–gamma globulin complex. This was true for non-immune serum and for immune and hyperimmune swine fever serum. Toxicity of heated swine serum was related to the temperature of heat treatment. Toxicity was observed in serum heated at 62° and 65°C. but was absent in serum heated at temperatures below 62° or at 68° to 69°. Gel formation occurred at 69°C. Commercially-produced hyperimmune swine fever serum contained albumin-gamma globulin complex. Inoculation of anaemic animals with such sera sometimes caused severe reactions, while normal animals were not affected. The complex in heated swine serum was serologically and immunologically related to that in heated equine serum. A previous inoculation of anaemic or normal pigs with swine erysipelas immune serum of equine origin could sensitize them against a later inoculation with commercial hyperimmune swine fever serum. The protective antibodies of hyperimmune swine fever serum survived heating at 70° for 30 min., but were destroyed or greatly reduced by heating at 75° for 30 min.

RENDEL, J. (1957). **Blood groups of farm animals.**—*Anim. Breed. Abstr.* **25,** 223-238. **2191**

A useful review of literature on blood groups of horses, cattle, sheep, pigs and fowls, and their practical use in determining parentage, monozygosity and breed structure. Haemolytic disease is also covered.—R.M.

HARRIS, W. E. & FULTON, J. D. (1958). **Quantification of anaphylaxis in mice.**—*Proc. Soc. exp. Biol., N.Y.* **97,** 14-17. [Authors' summary modified.] **2192**

Results indicated that haematocrit rise in anaphylactic mice is a sigmoidal function of the log dose bovine albumin in the challenge antigen preparation. Over a given range, the relationship tended to be linear. Indications were that haematocrit change is a continuous function, and not a ratio of "all or none" responses. This method was recommended for drawing quantitative comparisons in studies of mouse anaphylaxis.

KATSH, S. (1958). **Demonstration *in vitro* of anaphylactoid response of the uterus and ileum of guinea pigs injected with testis or sperm.**—*J. exp. Med.* **107,** 95-108. [Author's summary modified.] **2193**

Female g.pigs were injected with: homogenates of g.pig testis in saline or adjuvant; suspensions of washed g.pig spermatozoa in saline or adjuvant; homogenates of rabbit testis in adjuvant; g.pig and rabbit spermatozoa in adjuvant. Control animals received nothing or adjuvant alone. Between 15 and 39 days after injection the ilea and uterine horns were removed and tested *in vitro* for reaction to washed epididymal spermatozoa of the g.pig, rabbit, or bull. The organs of animals injected with homologous testis or spermatozoa in adjuvant responded strongly to challenge with homologous spermatozoa. The response was a contracture which began 10 to 30 sec. after the spermatozoa were injected into the bath and lasted for 5 min. to 4 hours, the longest period of observation. Responses lasting for 5 to 30 min. were obtained with the uteri of animals injected with g.pig testis or spermatozoa in saline. Animals injected with rabbit testis and adjuvant responded to rabbit spermatozoa, and animals injected with g.pig and rabbit spermatozoa in adjuvant reacted to both gametes. Organs from many of the controls reacted weakly to challenge with homologous spermatozoa. Organs which were retested showed that they had become desensitized. Testing with

heterologous spermatozoa indicated species selectivity. It is concluded that injections of spermatozoa or testis induce a hypersensitivity, which differs from true anaphylaxis. The nature of the response and the possibility of natural immunity to spermatozoa are discussed.

See also abstr. **1994** (antigenic specificity of staphylococcal coagulase); **2001** (fluorescein-labelled antibody for detection of anthrax); **2008-2013** (TB.); **2013-2014** (Johne's disease); **2016** (melioidosis); **2017-2019** (swine erysipelas); **2025-2026** (pasteurellosis); **2030** (K antigen in E. coli) **2031** (incomplete enterobacterial antibodies in umbilical cord blood); **2040-2049** (brucellosis); **2056-2057** (leptospirosis); **2079** (Sporotrichum); **2098** (purified antigen from Kedrowsky's bacillus for c.f. of kala-azar); **2104** (B. ovis infection); **2107-2108** (effect of cortisone on immunity to anaplasmosis in calves); **2112** (c.f. inhibition test in toxoplasmosis); **2118** (Swiss vaccine institute); **2119-2122** (F. & M. disease); **2123** (viruses); **2128-2129** (rabies); **2131** (interferon); **2132** (arthropod borne encephalitis); **2139** (Borna disease); **2140-2141** (rinderpest); **2145** (bluetongue); **2150** ("Kisenyi disease" of sheep); **2152-2154** (swine fever); **2155** (African swine fever); **2159** (Teschen and Talfan disease); **2161-2162** (distemper); **2163-2165** (canine virus hepatitis); **2168-2171** (Newcastle disease); **2172-2174** (ornithosis); **2179** (effect of cortisone on immunity of lab. animals to murine Typhus); **2206** (precipitation test for cysticercosis); **2263** (Q fever and brucella antibodies in sheep serum).

PARASITES IN RELATION TO DISEASE [GENERAL]

CAMPBELL, D. J. & KINGSCOTE, A. A. (1957). ***In vitro* and *in vivo* tests of polymeric piperazine-1-carbodithioic acid as an equine boticide and anthelmintic.**—*J. Amer. vet. med. Ass.* **130**, 533-536. **2194**

60 g. of the compound was given to a horse followed by 200 ml. of water and 300 ml. of 1:200 HCl. Ten days later the horse was slaughtered and the following percentages of activity recorded: *Gasterophilus intestinalis* 67; *G. nasalis* 93·6; large strongyles 0; small strongyles 96·3; *Oxyuris equi* females 100; and *Strongylus vulgaris* 55. Egg counts indicated 100% activity against *Ascaris equorum*. Two further horses dosed similarly passed bots and strongyles.

In vitro trials showed that bots were killed only at pH 2 or less.—D. POYNTER.

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

GAILIUNAS, P. (1958). **Effects of hypotonic and hypertonic sodium chloride solutions of first-instar *Hypoderma lineatum* larvae.**—*Amer. J. vet. Res.* **19**, 237-239. [Author's summary modified.] **2195**

The semi-permeability of the body wall of first-instar *H. lineatum* larvae was reported. *In vitro* tests with hypotonic and hypertonic NaCl solns. indicated that the time required to kill the larvae varied directly with their size and inversely with the concentration and temperature of the soln. It was suggested that NaCl given orally or parenterally might be of value for systemic control of the first-instar larvae.

HOWELL, D. E. (1957). **Grub control with Dow ET-57, a recently developed systemic insecticide.**—*Misc. Publ. Okla. agric. Exp. Sta.* No. MP-48. pp. 103-104. **2196**

Of 1,498 cattle half were given ET-57 orally at the rate of 100 mg./kg. body wt., and half were left untreated. Comparison of the numbers of warbles in the 2 groups indicated a control of about 76%. No evidence of toxicity was seen, except in a group of 24 steers which scoured for a few days after treatment.—M.G.G.

PETERSON, H. O., JONES, E. M. & COBBETT, N. G. (1958). **Effectiveness of Dow ET-57 (Trolene) against the nasal botfly of sheep.**—*Amer. J. vet. Res.* **19**, 129-131. [Authors' summary modified.] **2197**

Twenty-eight aged ewes, naturally infected with *Oestrus ovis*, were given a single treatment of ET-57 (0,0-dimethyl 0–2, 4, 5-trichlorophenyl phosphorothiolate) (Dow) as a 50% emulsifiable concentrate, by drenching at a dosage of 100 mg. per kg. body wt. Three to four days after treatment, all the first instars, except those in one of the ewes, were found dead. At the dosage used, the treatment was ineffective against the second and third instars. The drug was well tolerated and no ill-effects were observed.

FOSTER, R. (1957). **Observations on laboratory colonies of the tsetse flies *Glossina morsitans* West. and *Glossina austeni* Newstead.**—*Parasitology* **47**, 361-374. **2198**

F. gives details of maintaining a breeding colony of *G. morsitans*. The flies were best kept singly in tubes. The optimum temperature and humidity ranges were 74° to 80°F. and 60–75% R.H. respectively. A light intensity of at least one foot-candle was needed at the feeding site. In feeding the best results were obtained by offering food every fourth day, at a temp. of 80° to 81°F. Sheep provided the best host but g.pigs were useful for inducing newly emerged flies to feed. The condition of the skin at the feeding site was important.

Female flies lived longer than males. In both sexes the highest mortality occurred during the first 20 days of life. The optimum ages for mating were 10–14 days for males and 3–4 days for females; 90–100% of first and second generation females were fully inseminated. Each generation was less virile than the preceding one. Pupa production was decreased and the abortion rate increased in each generation. Pupal

viability remained constant throughout all generations but the mean pupal weight showed a progressive decrease, except for the pupae from the second and third generation flies. The mean interval without food during an interlarval period did not affect the duration of the period. Feeding on the day of parturition did not significantly affect the length of the succeeding interlarval period. The duration of an interlarval period was directly correlated with the length of the maximum interval without food during the period.

With *G. austeni* best results were obtained at 80° to 85°F. and 77–82% R.H. Feeding, longevity and reproduction were superior to *G. morsitans*.—D. POYNTER.

NELSON, W. A. (1958). **Transfer of sheep keds, *Melophagus ovinus* (L.), from ewes to their lambs.**—*Nature, Lond.* **181,** 56-57. **2199**

A study of sheep keds on ewes after parturition showed that only newly emerged keds were transferred to lambs.—D. POYNTER.

PANEBIANCO, F. (1957). Linguatulosi ninfale in polmone di bovino. [*Linguatula* **infestation of the lungs in cattle.**] — *Zooprofilassi* **12,** 527-537. **2200**

A high incidence of *Linguatula serrata* nymphs was encountered in slaughter cattle, sheep, goats and pigs. In the lungs of cattle these occurred as small nodules, up to the size of millet seeds (containing live and viable or dead nymphs, or their residue), or as small nodules having a solid lymphatic structure.

—T.E.G.R.

MURNAGHAN, M. F. (1958). **Neuro-anatomical site in tick paralysis.** — *Nature, Lond.* **181,** 131. **2201**

Experiments on dogs, given tick paralysis by the application of *Dermacentor andersoni*, indicated that the neuro-muscular block was dissimilar to that produced by the competitive and depolarizing blocking agents and anticholinesterases. The probable mechanism was failure in the liberation or synthesis of acetylcholine at the nerve terminals. Continuous secretion of a 'toxin' by the ticks is necessary to produce paralysis since rapid recovery occurs on their removal. The 'toxin' exhibits a specific predilection for the neuro-muscular junction.

—D. POYNTER.

See also absts. **2058** (role of arthropods in leptospirosis); **2105** (transmission of Theileria sergenti by Haemaphysalis bispinosa); **2132 & 2134-2138** (arthropod-borne encephalitis and equine encephalomyelitis in pheasants); **2146** (tick-borne meningoencephalomyelitis); **2194** (control of Gasterophilus); **2300** (toxicity of insecticides); **2372** (C.S.I.R.O. report, Australia).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

KRULL, W. H. (1958). **The migratory route of the metacercaria of *Dicrocoelium dendriticum* (Rudolphi, 1819) Looss, 1899 in the definitive host:** *Dicrocoeliidae.*—*Cornell Vet.* **48,** 17-24. [Author's summary modified.] **2202**

With the hamster and the white mouse as experimental hosts, it was proved that the metacercariae of *D. dendriticum* may reach the biliary system by migrating from the intestine through the opening to the common bile duct. They can reach all parts of the system in these small hosts within an hour. They were exceedingly active and were seen to enter the common bile duct from the intestine. It seems that writers have been in error in stating that the metacercaria of *D. dendriticum* penetrates tissues and reaches its destination by way of the portal blood system.

KOMJÁTHY, K. (1957). Szarvasmarhák májmételykórjának orvoslása bőr alá fecskendezett széntetrakloriddal. [**Treatment of liver fluke infestation in cattle by subcutaneous injection of carbon tetrachloride.**] — *Mag. állator, Lapja* **12,** 235-236. [In Hungarian. English and Russian summaries.] **2203**

Carbon tetrachloride was given s/c in doses increasing from 5 to 15 ml./100 kg. body wt. to 12 cows of different age and condition. It caused local irritation for 10 min. and with the maximum dose giddiness for 24 hours. Nine cows infected with liver fluke received 15–50 ml. carbon tetrachloride s/c. On the 12th day four, and on the 24th day two of these needed further doses for the complete elimination of infection. Of 63 infected cows, 10 needed a second treatment 3 weeks after giving 10 ml. per 100 kg. carbon tetrachloride s/c. At the site of injection occasional sterile abscesses occurred. The treatment should be avoided or given with care in the case of fat or emaciated animals and those in advanced pregnancy.

—ANDREW SEBESTENY.

VERDCOURT, B. (1957). **Possible occurrence of strains in species of schistosomes.**—*Nature, Lond.* **180,** 865-866. **2204**

The snail *Bulinus africanus ovoideus* occurs in the Kitui area of Kenya and carries *Schisto-*

soma haematobium. Cridland [*J. trop. Med.* (*Hyg.*) **58**, 1 (1955)] however stated that *B. africanus ovoideus* will not carry *S. haematobium* in Uganda. It is therefore suggested that the snail or the fluke or both exist in different strains.—D. POYNTER.

VARMA, A. K. (1957). **On a collection of paramphistomes from domesticated animals in Bihar.** — *Indian J. vet. Sci.* **27**, 67-76. [Author's summary modified.] **2205**

Seven species of amphistomes, representing seven genera, are recorded from different localities in Bihar. *Gastrothylax crumenifer* was the commonest and most widespread species. *Calicophoron calicophorum*, whose distinguishing features from *Gigantocotyle explanatum* are discussed, is recorded for the first time from Indian sheep and goats. *G. explanatum* was found only in the bile ducts of buffaloes. *Pseudodiscus collinsi* is recorded as a common parasite of horses.

BIAGI, F. & TAY, J. (1958). **A precipitation reaction for the diagnosiis of cysticercosis.**—*Amer. J. trop. Med.* **7**, 63-65. **2206**

Of several antigens tested, the best was one prepared from crushed *Cysticercus cellulosae* washed 2–3 times with acetone for 15 min., dried at room temp. and pulverized. The powder was suspended in 0·85% saline at a dilution of 1 : 100; the soln. was warmed at 37°C. for an hour and kept at 5°C. for 24 hours before use. Precipitin tests on serum from 39 infected and 50 uninfected pigs, indicated that the test was reliable and specific.—R.M.

ENIGK, K., DÜWEL, D. & FEDERMANN, M. (1958). Zur Behandlung des Lungenwurmbefalles beim Rind. [**Treatment of lungworms in cattle.**]—*Dtsch. tierärztl. Wschr.* **65**, 122-125. **2207**

In comparative therapeutic trials, 145 cattle with lungworms were treated with ascaridol aerosol, 134 with various piperazine compounds in aerosol form, and 75 with cyanacethydrazide [*V.B.* **28**, 1127] either by s/c inj. (63 cattle) or by mouth (12 cattle). The number of larvae in the faeces was counted before treatment and 10 and 21 days after (the results are tabulated). On commencing treatment the cattle were housed and were well fed. Results varied with degree of infestation, but in general ascaridol aerosol was superior to piperazine and cyanacethydrazide. When the latter was administered to fairly heavily infested cattle (50–100 larvae/10 g. faeces), larvae were absent from the faeces 10 days after treatment in 50% of the cattle, compared with 93% of those treated with ascaridol. —R.M.

KASSAI, T. (1957). Vizsgálatok a juhok gócos tüdőférgességéről VI. rész Vizsgálat a Cystocaulus ocreatus pathogenitásáról. [**Nodular verminous pneumonia in sheep. VI.** *Cystocaulus ocreatus* **infestation.**] — *Mag. állator. Lapja* **12**, 333-337. [In Hungarian. English and Russian summaries.] **2208**

From 65 well fed lambs, 4 months old and weighing an average of 23 kg., 30 lambs were each artificially infected with about 1,000 larvae of *Cystocaulus ocreatus*. No clinical symptoms were observed during the 4 months following the infection, although the faeces of 70% of them on the 78th day, 53% of them on the 113th day, and 29% of them on the 170th day contained larvae of *C. ocreatus*, and their average gain in weight during this time was less by 17·7% than that of the 35 uninfected controls. P.M. examination revealed numerous nodules in the lungs containing predominantly degenerated or dead worms and larvae. These findings suggest that good feeding is an important factor in increasing resistance, but is insufficient to prevent diminished weight gain.—A. SEBESTENY.

ALWAR, V. S., LALITHA, C. M. & SENEVIRATNA, P. (1958). *Vogeloides ramanujacharii* **n. sp., a new lungworm from the domestic cat** (*Felis catus* **Linne), in India.**—*Indian vet. J.* **35**, 1-5. [Authors' summary modified.] **2209**

The authors described a new species of lungworm, which they propose to name *Vogeloides ramanujacharii* n. sp., from cats in Madras. Twelve out of 50 cats examined harboured the worm. This species was differentiated from the other valid species of *Vogeloides*.

EDESON, J. F. B. & WHARTON, R. H. (1958). **The experimental transmission of** *Wuchereria malayi* **from man to various animals in Malaya.**—*Trans. R. Soc. trop. Med. Hyg.* **52**, 25-38. Discussion: pp. 39-45. [Authors' summary modified.] **2210**

W. malayi was successfully transmitted from man by direct inoculation of infective larvae into monkeys (*Macaca irus* and *M. rhesus*), slow loris (*Nycticebus coucang*), civet cats (*Viverra tangalunga*) and domestic cats. Adult worms corresponding to the description of *W. malayi* were recovered from experimentally infected cats, slow loris and a rhesus monkey. The domestic cat was the most suitable host; *M. irus* was difficult to infect. Strains of *W. malayi* from man were passaged successively

through a monkey, a cat and a slow loris, and through a cat into a monkey and into other cats. Infections in cats seemed to be stable, and lasted for upwards of a year. The microfilariae in all the infected animals were indistinguishable from those of the human donors, showed the same type of reduced periodicity, and developed normally in the vector mosquitoes. This evidence, together with the results of blood surveys in animals, indicated the presence in East Pahang, Malaya, of an animal reservoir of *W. malayi* capable of infecting man. The implications were discussed.

YEH LIANG-SHENG. (1958). **The differentiation of *Setaria cervi* and *S. digitata*, the two species commonly found in ruminants in Asia.**—*Trans. R. Soc. trop. Med. Hyg.* **52,** 11. **2211**

The author demonstrated specimens showing constant morphological differences between *S. cervi* and *S. digitata,* commonly found as mixed infections in ruminants in Asia. The mixed infection probably accounted for diversity of opinion as to the validity of the two species. The author had examined some 100–200 specimens from various parts of the world. The two species were most readily identified by the morphology of the tail of the female as described by Von Linstow: *S. digitata* having a large rounded terminal knob and *S. cervi* one or two circles of spines. This character was found to be constant and reliable, despite frequent damage to the tail. The "peribuccal lip", as described by Boulenger, was a less reliable character, this structure being the most frequently damaged part.—F.E.W.

CROFTON, H. D. (1957). **Nematode parasite populations in sheep on lowland farms. III. The seasonal incidence of species.**—*Parasitology* **47,** 304-318. **2212**

A study of the incidence of the different species of nematodes in lambs has led to development of a theory to explain the regular succession of 'dominant' species throughout the season. This succession is fairly constant from year to year. It is suggested that the pattern of seasonal incidence is a consequence of the life-history pattern of individual species and is directly connected with the rate of egg production and the time required for the development of each generation.—D. POYNTER.

TAKOS, M. J. & THOMAS, L. J. (1958). **The pathology and pathogenesis of fatal infections due to an acanthocephalid parasite of marmoset monkeys.**—*Amer. J. trop. Med.* **7,** 90-94. **2213**

Four of 10 squirrel-marmosets (*Saimiri orstedii*) died from peritonitis following perforation of the bowel by *Prosthenorchis elegans.* Perforation resulted from secondary infection of the lesions caused by the helminths.—R.M.

ENZIE, F. D., WILKENS, E. H. & COLGLAZIER, M. L. (1958). **The use of piperazines as anthelmintics for swine.**—*Amer. J. vet. Res.* **19,** 19-24. [Authors' summary modified.] **2214**

Piperazine may not be uniformly effective under field conditions. Competition among pen mates for limited amounts of medicated feed or water, differences in palatability of available preparations, and marked variations in water consumption occasioned by seasonal or diurnal fluctuations in atmospheric temperature may all contribute to inadequate dosing.

Critical studies of piperazine compounds under practical farm conditions are needed.

ORLOV, N. P. (1957). **[Biological principles of treatment and prophylaxis of parasitic diseases.]** —*Moscow: Gosud. izd. sel'skokhoz. lit.* pp. 158. 2r. 15k. (1s. 9d.) [In Russian.] **2215**

This monograph discusses relationships between helminth parasites and their hosts in the light of research performed in the U.S.S.R. during the past 15 years. The four chapters deal with host specificity, pathogenicity of parasites, immunity in the host, and practical conclusions. There are 6 pages of references to Russian work.—R.M

See also absts. **2194** (anthelmintic); **2218** (jaagziekte associated with lungworms); **2372** (C.S.I.R.O. report, Australia).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

LÁSZLÓ, F. (1957). Kórbonctani jegyzetek. **[Pathological notes.]**—*Mag. állator. Lapja* **12,** 242-245. [In Hungarian. English and Russian summaries.] **2216**

L. described the following. Multiple lymphosarcoma in the cervical lymph nodes of a 20-year-old gelding; a carcinoma on the pleura and pericardium (associated with an exudative pleuritis) of a 13-year-old gelding, without metastatis; a carcinoma weighing 4·5 kg. in the thymus, without metastasis, in a 6-month-old bull; a soft fibroma in the thyroid gland of an ox; a primary sarcoma of the gastrocnemius muscle of a 2-year-old heifer; an organizing

haematoma weighing 150 g. in the atrophied ovary of a fowl. Also described was an aneurysm in the wall of the right cardiac ventricle in a yearling pig.

—ANDREW SEBESTENY.

NUNES PETISCA, J. L. (1957). Contributo allo studio dei tumori primitivi del fegato nei mammiferi domestici. **[Primary neoplasms of the liver in domestic mammals.]**—*Veterinaria, Milano* **6**, 140-155. [English, French and Portuguese summaries.] **2217**

Literature on the incidence, classification, histogenesis and histopathological diagnosis of primary neoplasms of domestic mammals is reviewed. Among 38 liver specimens examined the following types of tumour were encountered: liver cell tumour, 32 (23 in the ox, 1 in the sheep, 3 in the horse, 4 in the dog and 1 in the cat); cholangioma 2 (1 in the ox and 1 in the dog); hepatocholangioma, 1 (in the ox); endothelioma, 1 (in the ox); histiocytoma, 2 (in the ox). The microscopic appearance, histogenesis and malignancy of the tumours are discussed.

—T.E.G.R.

ROMBOLI, B. & BOTTI, L. (1957). "Jagziekte" nella pecora. **[Jaagziekte in sheep in Italy.]** — *Atti Soc. ital. Sci. vet. Perugia* 1956 **10**, 416-419. [English and French summaries.] **2218**

Pulmonary adenomatosis in sheep, associated with lungworm infestation and similar to jaagsiekte in its gross and microscopic lesions is described. This is considered to be the first report of the disease in Italy.—T.E.G.R.

ANDERSON, D. E. & CHAMBERS, D. (1957). **Genetic aspects of cancer eye in cattle.** — *Misc. Publ. Okla. agric. Exp. Sta.* No. MP-48. pp. 28-33. **2219**

In 93 matings the incidence of cancer eye was 44·4% in the progeny of two susceptible parents, 23·7%–26·7% in the progeny of one susceptible and one resistant parent, and 8·8% in the progeny of two resistant parents. The incidence of cancer eye lesions on the eyelids could be reduced by breeding for increased lid pigmentation, but the incidence of lesions on the eyeball and nicitating membrane must be reduced by breeding form aged animals that have proved to be resistant to the disease. [See also *V.B.* **28**, 497 & 1496.]—M.G.G.

BARNES, J. M., MAGEE, P. N., BOYLAND, E., HADDOW, A., PASSEY, R. D., BULLOUGH, W. S., CRUICKSHANK, C. N. D., SALAMAN, M. H. & WILLIAMS, R. T. (1957). **The non-toxicity of maleic hydrazide for mammalian tissues.**—*Nature, Lond.* **180**, 62-64. **2220**

A selective weedkiller and depressant of plant growth, maleic hydrazide, was proved by conventional tests to be harmless to rats, mice, g.pigs, dogs and hens. It had been found that the arrest of plant cell division was accompanied by chromosome breakage and since such agents are mostly cancer producing as well, the present work was intended to show whether or not maleic hydrazide has any carcinogenic properties for mammalian tissues. Administration of the compound by mouth or by weekly injection to rats and mice over a period of 2 years had no effect on general health or growth nor was there any increase in the incidence of tumours compared with controls. Large doses were also given to rats bearing Walker tumours, but no effect on tumour growth or cell mitosis was observed. Maleic hydrazide had no effect on mitosis or cell division in mouse epidermis grown in a phosphate buffer containing glucose, nor on skin from g.pig's ear in tissue culture. There was sufficient evidence to conclude that maleic hydrazide has no carcinogenic properties.—E.V.L.

MONTEMAGNO, F., PAPPARELLA, V. & CATELLANI, G. (1957). Contributo allo studio dell'eziologia della leucosi linfatica dei bovini. Primi risultati di trasmissione sperimentale in uova embrionate di pollo ottenuti mediante inoculazione di filtrato di materiale proveniente da un vitello affetto di leucosi linfatica. (Nota preventiva). **[Aetiology of lymphatic leucosis of cattle. Experimental transmission of the disease to chick-embryos. (Preliminary note).]**—*Acta med. vet., Napoli* **3**, 185-192. [English, French, German and Spanish summaries.] **2221**

Twenty serial passages were carried out in 7-day-old chick embryos with a filtrate of lymph node tissue from a calf with lymphatic leucosis. Embryo mortality varied from 2 to 100%, mainly after 36–72 hours. Transmission experiments in cattle are in progress.—T.E.G.R.

BERNHARD, W., BONAR, R. A., BEARD, D. & BEARD, J. W. (1958). **Ultrastructure of viruses of myeloblastosis and erythroblastosis isolated from plasma of leukemic chickens.** — *Proc. Soc. exp. Biol., N.Y.* **97**, 48-52. [Authors' summary modified.] **2222**

Ultra-thin sections of the pellets formed by ultracentrifugation of plasma from birds with myeloblastosis and erythroblastosis were examined by electron microscopy. In the material from both diseases similar round or oval structures were seen, consisting of a dense central core of about 40 mμ diameter, surrounded by a less dense material limited by an outer membrane-like structure, the total particle diam.

being about 80 mμ. In many instances the limiting membrane appeared to be double. The ultrastructure of these agents of the avian leucaemic diseases was very similar, if not identical, to that of the viruses of other fowl neoplasms. No particles with these characteristics were obtained from the plasma of apparently healthy chickens.

I. Fontes, A. K., Burmester, B. R. & Iseler, P. E. (1957). **Cultivation in tissue culture of the virus of avian visceral lymphomatosis.** —*Poult. Sci.* **36**, 1117-1118. **2223**

II. Sharpless, G. R., Defendi, V. & Cox, H. R. (1957). **Cultivation in tissue culture of the virus of avian lymphomatosis.**—*Ibid.* 1156. [Authors' absts. modified.] **2224**

I. Strain RPL 12 virus, which produces visceral lymphomatosis and oesteopetrosis in chickens, was cultivated in tissue cultures of chick embryo livers. Cells from trypsinized livers were grown in Solution 199 containing 30% horse serum. Cytopathogenic effect was manifested in cell cultures at 48 hours.

The infectivity of tissue culture fluids was tested by i/v inoculation of 10-day-old White Leghorn chick using third passage material which had a titre of 10^{-3} to 10^{-4} tissue culture LD_{50}. Tissue culture virus was neutralized by visceral lymphomatosis immune serum.

The fibroblasts of the cultures were the first cells to be affected: the cytopathogenic effect was manifested by definite granulation in the cytoplasm followed by pyknosis. Degenerative changes subsequently occurred in the epithelial-like cells, which became rounded and appeared highly refractile. This effect was progressive until most of the cells became involved and fell off the walls of the tubes.

II. The virus of avian lymphomatosis (strain RPL 12) was propagated in cultures of either whole chick embryo or embryo liver. Cells from trypsinized 10-day embryos were grown in Eagle's medium with 10% horse serum and those from 16-day embryo livers were grown in Morgan's 199 medium with 30% horse serum. When a sheet of cells was formed and before the cultures were inoculated, the medium was changed to 199 without serum.

A cytopathogenic action was evident in liver cells 18 hours after inoculation. Parenchymal cells in the liver cultures were the first affected: there was swelling and rounding and and they appeared highly refractile. The fibroblasts were later affected in a similar manner. Titres as high as 10^9 tissue culture $I.D._{50}$ per ml. have been obtained. Culture virus was neutralized by visceral lymphomatosis immune serum diluted as much as 1:2000. Chick embryos infected i/v developed malignant cells within 3 days. Three-week-old White Rock chicks inoculated i/v with the 11th passage of virus developed lymphomatosis.

NUTRITIONAL AND METABOLIC DISORDERS

Yeates, N. T. M. (1958). **Observations on the role of nutrition in coat shedding in cattle.**—*J. agric. Sci.* **50**, 110-112. [Author's summary modified.] **2225**

The coat changes of a test group of four undernourished Shorthorn heifers were compared with those of four well-fed controls. Low nutrition impeded seasonal shedding in three of the test animals, and the hair which was retained into the summer months appeared lifeless and bleached. One animal's hair and shedding were normal, despite low nutrition. Two of the controls also partially retained their hair in the summer, but it was of normal colour, good lustre, and vital appearance. It was concluded that nutrition influences shedding, though some individuals within a breed are less affected than others. Two distinct varieties of coat retention were observed: one of nutritional origin, the other inherent. Possible explanations of the differences were suggested.

Bailey, G. L. & Broster, W. H. (1958). **Experiments on the nutrition of the growing dairy heifer. III. Effects of air temperature and live weight on water consumption.**—*J. agric. Sci.* **50**, 8-11. [Authors' summary modified.] **2226**

The effects of air temperature (30° to 70°F.) and live weight upon the water consumption of dairy heifers from 350 to 550 lb. live wt. and the amount drunk in different periods of the day were studied. The water consumption increased by 0·03–0·06 gal. per unit rise in temp. and by 0·0075 gal./lb. increase in live wt. Most of the water consumption occurred during meals.

Alder, F. E. & Davies, W. (1958). **Bloat investigations.** — *J. agric. Sci.* **50**, 43-48. [Authors' summary modified.] **2227**

Hereford crossbred steers were grazed or fed on legume-dominant herbage in an endeavour to produce pasture bloat. Observations were made to determine patterns of animal behaviour and bloat incidence. Heart rates were determined both before and during the experiments and jugular blood samples were taken for determination of cholinesterase levels. Herbage samples

were analysed botanically to determine the type of material eaten, and chemically for nitrogen content. Other herbage samples were placed in cold storage.

In the 7 experiments (375 cattle feeding or grazing days) only 27 cases of mild bloat and 5 of moderate bloat were recorded. This was surprising, because pains had been taken to provide feed that by all normal standards would be regarded as likely to induce bloat.

I. McDowall, F. H., Patchell, M. R. & Reid, C. S. W. (1957). **Bloat in cattle. V. Effects of ingestion of whale oil on production and composition of milk, on flavour of milk and butter, and on properties of butterfat.**—*N. Z. J. Sci. Tech.* Sect. A. **38**, 1036-1053. **2228**

II. McDowall, F. H., Reid, C. S. W. & Patchell, M. R. (1957). **Bloat in cattle. VI. Effects of ingestion of linseed oil, soya-bean oil, mixed beef and mutton tallow, and peanut oil on production and properties of milk and butterfat.**—*Ibid.* 1054-1080. **2229**

I. Because of its marked effects on the flavour of milk, cream, and butter, and on the properties of the butterfat, whale oil is considered to be unsuitable for treating or preventing bloat in dairy cows.

II. As a result of experimental dosing of cattle it was concluded that it is inadvisable to treat more than a small proportion of the dairy herd at a time with vegetable oils in high dosage, and that peanut oil is the most suitable. At the dosage recommended for treatment or for prophylaxis by pasture spraying or by addition to the water supply, any of these oils could be safely given to the whole herd over long periods. —M.G.G.

Lindahl, I. L., Davis, R. E., Jacobson, D. R. & Shaw, J. C. (1957). **Feedlot bloat studies. I. Animal and dietary factors.**—*J. Anim. Sci.* **16**, 165-178. **2230**

In long-term studies of bloat in cattle in "feed-lots", no significant differences in the bloating effect of the basal diet (61% barley, 22% lucerne meal, 16% soya bean oil meal and 1% sodium chloride) were obtained by substituting maize for the barley or lucerne hay nor the lucerne meal. There was a significant individual difference in susceptibility to bloat and this was not related to eating habits. A highly significant increase in the incidence and severity of bloat occurred as the length of time on bloat-producing diets increased. This was not the result of increased feed consumption. Factors in addition to lack of sufficient roughage appeared to be involved; rumen atony did not appear to be one of them.—A. Ackroyd.

Gutierrez, J., Davis, R. E. & Lindahl, I. L. (1958). **Dissimilation of alfalfa saponins by rumen bacteria.**—*Science* **127**, 335. **2231**

Saponon-digesting bacteria were isolated from the rumen of six steers that were being fed fresh lucerne. In cultures these bacteria produced a viscous slime which was equivalent to about half of the saponin provided in the substrate. Heavy froth formation was readily demonstrated in rumen contents containing viable micro-organisms, but not after inactivation at low temp. The authors' results supported the theory that "frothy bloat" of ruminants may be caused by an increase in the production of bacterial polysaccharide slime.—R.M.

Christian, K. R. & Williams, V. J. (1957). **Rumen studies in sheep. IV. The rumen metabolism of fresh and dried grass.**—*N. Z. J. Sci. Tech.* Sect. A. **38**, 1003-1010. [Authors' summary.] **2232**

Six sheep were fed fresh and dried grass from the same sward at the same level of dry-matter intake, and the concentrations of rumen microbial end-products were determined in samples removed at hourly intervals, two before and six after feeding. Heat drying of the grass increased the pre-feeding levels of volatile fatty acids but decreased the rise following feeding; changed the large and rapid rise in ammonia after feeding to a continuous fall; lowered the ability of the rumen to support microbial growth; but produced little effect on ruminal protein nitrogen concentrations. It is concluded that results from rumen fermentation studies using dried grass cannot be applied to grazing animals.

Stuart, R. C., Tocker, H. H., Stonyer, E. & Evans, H. (1957). **Lamb ill-thrift in Ashburton County.**—*N. Z. J. Agric.* **95**, 449, 451, 453, 455-456. **2233**

The results are given of a survey of 'ill thrift" in lambs in Ashburton County, New Zealand. Ill-thrift is a wasting disease in which lambs refuse to eat and in some cases die from starvation. Losses were worst in January and February which are dry months. The disease was associated with the grazing of rank and bulky pasture and was most effectively cured by transferring the lambs to freshly irrigated pasture. Transference to new grass or pure white clover was effective to a lesser degree. The administration of phenothiazine, trace elements or calciferol was ineffective. There was no evi-

dence of a relationship between ill-thrift and lambing and weaning dates, breed or sex of sheep.—E. J. CASTLE.

CUNNINGHAM, I. J. (1957). **Studies in the control of bowie in lambs.**—*N. Z. vet. J.* **5**, 103-108. [Author's summary modified.] **2234**

Attempts to prevent 'bowie' in lambs by supplementing the diet of the ewe or of the lamb were unsuccessful. Experimental work has eliminated as the primary cause a dietary excess of manganese or a deficiency of one or more of a number of trace elements that could be of nutritional importance to lambs. Dosing calciferol to lambs failed to prevent bowie, and this confirmed the differentiation of this disease from rickets.

BERTHELON, M. (1957). Entéro-dermite des porcelets de trois semaines. **[Enteritis with dermatitis in piglets three weeks old.]**—*Rev. Méd. vét.* **108**, 417-422. **2235**

The disease occurred mostly in large litters (10–13) at about three weeks of age and, as a rule, all the piglets in the litter were affected. It was afebrile and was characterized by a yellowish white diarrhoea, emaciation, conjunctivitis and exudative dermatitis (with formation of brown crusts) on the face and, later, on other parts of the body; mortality was relatively low. No causal organism was demonstrable and the condition was attributed to nutritional deficiency due to depletion of the sow's milk. Treatment consisted in supplementing the piglets' diet with milk, withholding all solid food from the piglets and supplementing the sow's ration with ground-nut cake. Turning the sow and piglets out to grass for 2–3 hours daily was beneficial. —T.E.G.R.

MARSDEN, A., JENNINGS, R. C. & MARTIN, R. S. (1957). **Inorganic iodine is not the factor in fish meal which depresses hatchability.** — *World's Poult. Sci. J.* **13**, 291-302. [Authors' summary modified.] **2236**

Iodine (as potassium iodide) at 0·29–1·84 p.p.m. in the diet of hens did not depress hatchability, nor did it appear to cause any gross abnormalities in the chicks. The ability of the chick thyroid to assimilate radioactive iodine was reduced by feeding potassium iodide or white fish meal to the hen.

GITLER, C., SUNDE, M. L. & BAUMANN, C. A. (1957). **Necrogenic potency of yeasts grown on various media.**—*J. Nutr.* **63**, 399-408. [Authors' summary modified.] **2237**

Death due to hepatic necrosis occurred rapidly in 100% of vitamin E-depleted rats fed *Torulopsis utilis* grown on spent sulphite liquor (SSL) as the sole source of protein. Comparable diets containing brewers' by-products yeast did not produce necrosis. Survival was increased by increasing the level of the torula-SSL yeast in the diet.

T. utilis and *Saccharomyces cerevisiae* grown on a synthetic medium were both necrogenic, but when grown on commercial beer wort both were non-necrogenic. Liver necrosis was prevented by the addition of methylene blue or diphenyl-*p*-phenylenediamine to the diet; butylated hydroxytoluene was ineffective.

LEE, H. W. & MOINUDDIN, J. F. (1958). **Effect of oral chlortetracycline on diarrhea and on dry weights of cleaned intestinal organs in rats fed two different diets.** — *Amer. J. Physiol.* **192**, 421-426. [Authors' abst. modified.] **2238**

Feeding chlortetracycline in the diet reduced the frequency of defaecation in rats fed a basal maize-starch diet or a 25% lactose diet, but did not influence diarrhoea which occurred in some lactose-fed rats. The antibiotic did not significantly alter the absolute wt. of the small intestine or colon plus rectum, but it decreased the ratio of small intestine wt. to body wt. in lactose-fed rats and the colon plus rectum/body wt. in both groups. It increased the absolute and relative weights of the caecum in rats fed maize starch, but did not affect the enlarged caeca of lactose-fed rats. The length of small intestine was not changed by the antibiotic but was increased by a lactose diet.

LEV, M., BRIGGS, C. A. E. & COATES, M. E. (1957). **The gut flora of the chick. 3. Differences in caecal flora between 'infected', 'uninfected' and penicillin-fed chicks.**—*Brit. J. Nutr.* **11**, 364-372. [Authors' summary modified.] **2239**

Comparative bacteriological studies were made of 'infected' chicks (which show a growth response to penicillin in the diet), and of 'uninfected' chicks (which do not), and of penicillin-fed chicks. No differences were found in total numbers of lactobacilli, streptococci or coliforms in infected and uninfected groups of chicks when six sites in the gut were sampled. Distinct differences were found in the clostridial population: *Cl. welchii* appeared the day after feeding in the caeca of the infected but not of the uninfected chicks. The presence of *Cl. welchii* was used as an index of the reappearance of infection in newly cleaned premises. When penicillin was fed to chicks *Cl. welchii* was eliminated. In an experiment with chicks from another source the numbers of *Cl. welchii* were similar whether the chicks received penicillin or not, but the toxi-

genicity of the strains from the penicillin-treated group was markedly impaired on first isolation. In a further experiment the numbers of *Cl. welchii* were reduced and their toxigenicity was impaired. The significance of these results in relation to the mode of action of antibiotics in growth stimulation was discussed.

FISHER, L. E. (1957). **Palsy syndrome in tiger cubs.** — *J. Amer. vet. med. Ass.* **131,** 240-241. **2240**

At one month of age, a palsy with bobbing of the head when walking was observed in 2 of 3 tiger cubs which had all been bottle-fed from birth. The tremors did not persist during sleep. Corticotrophin and vitamin B_{12} injections were given daily for 5 days followed by injections of vitamin E; improvement was rapid and no laboratory tests were made. At 10 months the animals were entirely normal.—E.V.L.

CUNNINGHAM, I. J. (1957). **Dual deficiency of copper and cobalt in Hawke's Bay.**—*N. Z. vet. J.* **5,** 101-103. [Author's summary modified.] **2241**

Analysis of livers of unthrifty sheep and a dosing trial revealed the existence of a dual deficiency of copper and cobalt in Pakipaki coarse sandy loam in Hawke's Bay. This soil has its origin in Taupo pumice and covers about 3,800 acres, most of which is used for sheep rearing.

ALLCROFT, R. & LEWIS, G. (1957). **Copper nutrition in ruminants. Disorders associated with copper-molybdenum-sulphate content of feeding stuffs.**—*J. Sci. Fd Agric.* **8,** Suppl. pp. 96-104. **2242**

A review of recent work on copper deficiency and chronic copper poisoning in cattle and sheep. Results are given of the copper, molybdenum and inorganic sulphate content of pastures in parts of Great Britain where copper deficiency exists: the copper content was higher than that associated with hypocuprosis in Australia.—R.M.

ASKEW, H. O. (1957). **Molybdenum in relation to the occurrence of xanthin calculi in sheep.** —*Ann. Rep. Cawthron Inst. Nelson N.Z.* 1956-57. pp. 28-30. **2243**

In certain areas of New Zealand where sheep graze pasture on soil with a low molybdenum content, xanthine calculi may develop in their kidneys. In other areas the molybdenum content is equally low but these calculi do not occur. The calculi can be prevented or their incidence reduced by improving the pasture, but without necessarily increasing its molybdenum content. The invasion of the pasture by gorse and the consumption of its tips, which are relatively high in phosphate and nitrogen, is said to decrease the incidence of the calculi.
—E. J. CASTLE.

BARTLETT, S., BROWN, B. B., FOOT, A. S., HEAD, M. J., LINE, C., ROOK, J. A. F., ROWLAND, S. J. & ZUNDEL, G. (1957). **Field investigations into hypomagnesaemia in dairy cattle, with particular reference to changes in the concentration of blood constituents during the early grazing period.**—*J. agric. Sci.* **49,** 291-300. **2244**

In five experiments groups of milking cows (total 62 animals) were changed abruptly from stall feeding to strip-grazing spring grass. In most of the cows this change resulted in a distinct fall in serum magnesium, but there was considerable individual variation. Friesians were generally less susceptible than Shorthorns and Guernseys, and there was no correlation between milk yield and the degree of hypomagnesaemia. A high serum magnesium level at the start of grazing delayed the onset of hypomagnesaemia by a few days only, and in general the application of nitrogenous fertilizer increased its incidence. Neither supplementary feeding nor the feeding of cut grass in the stall prevented hypomagnesaemia.

The change from stall to pasture feeding did not affect serum calcium, sodium, potassium, or blood glucose, but there was a marked increase in the non protein nitrogen, urea nitrogen and ammonia nitrogen, especially when the swards were heavily dressed with nitrogenous fertilizer.—E. J. CASTLE.

I. HALSE, K. (1958). **Hypocalcemia accompanied by changes in blood magnesium in starving cows. A preliminary report.**—*Nord. VetMed.* **10,** 1-8. [In English. German and Norwegian summaries.] **2245**

II. HALSE, K. (1958). **Apparent strengthening of calcium homeostasis in cows by starvation of short duration.**—*Ibid.* 9-16. [In English. German and Norwegian summaries. Author's summaries modified.] **2246**

I. Hypocalcaemia of the same severity as in normally calving cows was observed in cows starved for 2 days. All the starved cows had changes in serum magnesium. In early starvation it often rose, then became very low after feeding recommenced. Some animals became acutely ill, with changes in the mineral content of the blood. Mg values between 0·45 and 4·8 mg.% were recorded.

II. Two cows, subjected to a starvation period of 2 days, followed by a second, similar starvation period 2 days later, were hypocal-

caemic in the first period, but normal in the second. This improvement may have been due to an increase in parathyroid activity or to adjustments connected with a lowered blood magnesium concentration.

HUGHES, L. E. & KERSHAW, G. F. (1958). **Metabolic disorders associated with movement of hill sheep.**—*Vet. Rec.* **70,** 77-78. **2247**

A description is given of two incidents in which flocks of hill ewes, brought down to lowland pastures to lamb, showed symptoms of a nervous disorder the following day. This could be fatal but it responded favourably to injections of calcium and magnesium. There was some evidence that in one flock the affected ewes had hypocalcaemia and in the other flock unaffected animals had serum calcium and magnesium levels below normal.—E. J. CASTLE.

BARBER, R. S., BRAUDE, R., CLARKE, P. M. & MITCHELL, K. G. (1958). **Studies on anaemia in pigs. III. Comparison of one, two and three injections of iron for pigs reared indoors.** —*Vet. Rec.* **70,** 13-15. **2248**

Iron injections were given i/m to 3 groups, each consisting of 20 piglets. The first group received iron on the 4th day of life, the second on the 4th and 14th days, and the third on the 4th, 14th and 28th days. Each injection contained 100 mg. of Fe. Creep meal containing supplementary iron was provided *ad libitum* from the 10th day. The haemoglobin content of the blood was lowest in piglets given a single injection of Fe, and highest in those given 3 injections, although not quite so high as that previously observed in outdoor litters. There was no significant difference in weight between the 3 groups at any stage of the 8 weeks' suckling period. This suggests that the better growth of pigs reared outdoors is not connected with iron supply.—M.G.G.

COLLERY, L. (1957). **The iron cycle in the rat.** —*Irish vet. J.* **11,** 218-221. [Author's summary modified.] **2249**

Red oxide of iron as Fe59 was fed to pregnant and lactating rats. Examination of blood, spleen, liver and intestine at varying periods up to 90 days after cessation of administration showed that although the other organs remained positive up to 60 days, and the blood up to 90 days, the intestine was negative after 28 days. Iron is therefore not normally stored in the intestinal mucosa of the rat, and a "mucosal block" against further absorption cannot be postulated in this species.—M.G.G.

GOLBERG, L. & SMITH, J. P. (1958). **Changes associated with the accumulation of excessive amounts of iron in certain organs of the rat.** —*Brit. J. exp. Path.* **39,** 59-73. [Authors' summary modified.] **2250**

Gross iron overloading was induced in rats by i/m administration of a total of 1·65 g. Fe/kg. body weight. The sequelae resembled many of the pathological and biochemical changes observed in rats deficient in vitamin E. Some of these changes were accentuated by cod-liver oil in the diet, while vitamin E had a protective action. Three types of ceroid-like polymeric pigments were found in the tissues and their mode of formation is discussed.

MILLEN, J. W. & DICKSON, A. D. (1957). **The effect of vitamin A upon the cerebrospinal-fluid pressures of young rabbits suffering from hydrocephalus due to maternal hypovitaminosis A.** — *Brit. J. Nutr.* **11,** 440-446. [Authors' summary modified.] **2251**

Intraventricular cerebrospinal-fluid pressures were measured in 28 young rabbits with hydrocephalus caused by maternal vitamin A deficiency. In all except four animals ventriculography was also carried out. After the pressure measurement the animals were given 10,000–20,000 i.u. vitamin A acetate orally or subcutaneously. This led to a rapid fall in the c.s.f. pressure and the fall generally continued until the pressure reached normal limits. Six of the animals had survived for over 12 months and remained in good health. From these results it was suggested that the increased c.s.f. pressure found in animals suffering from vitamin A deficiency was a direct consequence of this deficiency. The findings were discussed in relation to previous observations on the relationship between vitamin A deficiency and increase of intracranial pressure.

NEWBERNE, P. M. & O'DELL, B. L. (1958). **Histopathology of hydrocephalus resulting from a deficiency of Vit. B_{12}.** — *Proc. Soc. exp. Biol., N.Y.* **97,** 62-65. [Authors' summary modified.] **2252**

Female rats deficient in vitamin B_{12} produced offspring with a high incidence of hydrocephalus. The cerebral cortex of hydrocephalic brains was decreased in thickness and in some areas the ependyma was missing. The morphology of epidymal and choroid cells was deranged and the cells had accumulated lipide. Tall columnar-type cells normally present as an intact layer in the roof of the third ventricle and aqueduct of control rats were occasionally found in hydrocephalic brains in which the aqueduct was occluded.

GARCIA, T. P. & PAREDES, J. R. (1957). La vitamina A como factor de fertilidad en el gallo. **[Vitamin A as a fertility factor in cockerels.]** — *Rev. Patronato Biol. anim., Madrid* **3**, 78-87. **2253**

The general condition of the cockerels, the libido and the volume of ejaculate were not affected by deficiency in vitamin A and carotene. The ejaculate became transparent and watery, the spermatozoa progressively lost their motility (which was reduced to one fifth by the tenth week), and there was a marked reduction in the average weekly concentration of spermatozoa which in one case reached the low level of 48,000/cu.mm. The number of abnormal forms increased. Conditions were restored to normal by the daily administration of 30,000 i.u. of vitamin A per kg. of feed for 2 weeks.

—T.E.G.R.

GARTON, G. A., DUNCAN, W. R. H., MADSEN, K. A., SHANKS, P. L. & BEATTIE, I. S. (1958). **Observations on feeding pigs on a low-fat diet with and without supplementary tocopherol.** —*Brit. J. Nutr.* **12**, 97-105. [Authors' summary modified.] **2254**

Three groups each of 4 pigs were reared to about 130 lb. live wt. on a basal tocopherol-deficient, low-fat diet supplemented in two groups with 5 or 10 mg. tocopherol acetate/kg. body wt. daily. Those given tocopherol did not have more iodine in the inner and outer back fat or more tocopherol in the serum than controls, nor was the amount or composition of the fatty acids in the liver fats altered. No liver lesions were observed. In a second experiment the basal diet was fed to 9 pigs from weaning to over 200 lb. live wt. During the final 28 days of the experiment 4 pigs were given cod-liver oil daily, in an attempt to precipitate tocopherol deficiency but without success. The back fat of all 9 pigs was similar in the degree of unsaturation to that of the animals in the first experiment. The concentration of tocopherol in the serum was with two exceptions lower than in the pigs killed at 130 lb. Liver lesions were found in 6 animals, only one of which had received cod-liver oil; the lesions, mainly portal fibrosis, appeared to be associated with tocopherol depletion.

DAVIES, M. E. (1957). **The value of routine testing for pancreatic enzyme (trypsin) deficiency in canine faeces.** — *Vet. Rec.* **69**, 1071. **2255**

Non-specific diarrhoea in dogs often responded favourably to treatment with pancreatic extract. 130 samples of faeces from such cases were, therefore, examined for the presence of pancreatic enzyme. Details of the test are given. 32 of the samples contained little or no trypsin, and pancreatic extract was given to 16 of these cases; there was a marked improvement in10.

—E. J. CASTLE.

SØRENSEN, P. H. & MOUSTGAARD, J. (1957). **Investigations on thyroid function in pigs.**— *K. VetHøjsk. Aarsskr.*, 1957 pp. 83-96. [In English. Authors' summary modified.] **2256**

Data were presented on seasonal variations in concentrations of serum protein-bound iodine and of thyroid iodine in pigs. Concentrations of serum iodine increased in winter and decreased in summer, while high conc. of thyroid iodine were found in late summer and in autumn, and low conc. were observed in spring.

A method for determination of thyroid secretion rate in pigs was outlined. After injection of radioactive iodine, the secretion of radioactive thyroid hormone was estimated by means of a rate constant for hormone secretion and the amount of radioactive iodine present in the thyroid gland. By dividing this quantity by the specific radioactivity of the circulating thyroid hormone, the thyroid secretion rate was calculated.

Thyroid secretion rates were determined in 18 Danish Landrace and in 7 Large White pigs, and were found to average 0·7 mg. of thyroxine per day for pigs of about 60 kg. of body weight. There was no difference in thyroid secretion rate between the two breeds. Thyroid secretion rate was negatively correlated with daily gain in weight. Iodine requirement was estimated, and it was found that 1 mg. iodine per kg. dry matter in feed was adequate.

SEEKLES, L., REITSMA, P., DE MAN, T. J. & WILSON, J. H. G. (1958). Resultaten van de tijdige intraveneuze toediening van hoge doseringen kristallijn vitamine D3 in gesolubiliseerde vorm aan rundvee ter voorkoming van melkziekte. **[Effect of intravenous injection of high doses of crystalline vitamin D3 on the occurrence of milk fever in cows.]**— *Tijdschr. Diergeneesk.* **83**, 125-136. [In Dutch. English, French, German and Spanish summaries.] **2257**

A single i/v inj. of 10,000,000 i.u. vitamin D_3 in soluble form, 2–8 days before parturition, reduced the incidence of milk fever. Of 39 treated cows, 6 developed milk fever, compared with all 18 untreated cows. All the cows had had milk fever before.—R.M.

ALEXANDER, F. (1958). **The effect of adrenaline, A.C.T.H. and insulin on the circulating**

eosinophils of the cow.—*J. comp. Path.* **68,** 64-70. [Author's conclusions modified.] **2258**

Adrenaline in doses of 25 μg./kg. injected s/c failed to produce a significant eosinopenia; in one cow in a group of six, an eosinopenia was produced by 50μg./kg. Corticotrophin in adequate dosage produced an eosinopenia within 2–4 hours. Insulin (1·25 units/kg.) caused a marked hypoglycaemia without clinical signs, and an inconsistent effect on the eosinophiles. The high doses of adrenaline caused a fall in milk yield, whereas insulin and corticotrophin had no effect. The results do not support the view that only cows with ketosis fail to develop eosinopenia after the administration of adrenaline owing to "temporary exhaustion of the pituitary gland".

De Groodt, M. (1958). De betekenis van de reactie van Ashbel en Seligman voor het histochemisch aantonen van ketosteroiden. **[Value of the histochemical test for ketosteroids described by Ashbel and Seligman.]** — *Vlaams. diergeneesk. Tijdschr.* **27,** 14-21. [In Flemish. English, French and German summaries.] **2259**

The method of staining ketosteroids described by Ashbel & Seligman [*Endocrinology* **44,** 565 (1949)] was compared with staining by Sudan III and other tests on rat adrenal glands. The author located ketosteroids in the spongiocytes of the adrenal cortex.—R.M.

Huber, W. G. (1958). **A comparison of glucose and prednisolone for treating ketosis.**—*Vet. Med.* **53,** 55-56. **2260**

Five cows with ketosis were treated successfully with prednisolone, and recovered their milk yield in 3 to 5 days. The same cows were affected again in the subsequent lactation and were treated with intravenous glucose, but it was necessary to follow this by prednisolone before recovery ensued.—E. J. Castle.

See also absts. **1999** (effect of nutrition on resistance of milk to Str. agalactiae); **2037** (heat treatment of feeding stuffs); **2372** (C.S.I.R.O. reports, Australia).

DISEASES, GENERAL

Davey, T. H. (1958). **Domestic animals and human disease.**—*J.R. Inst. publ. Hlth* **21,** 15-24. **2261**

A general account of diseases transmitted from animals to man.—R.M.

Bouvier, G., Burgisser, H. & Schneider, P. A. (1957). Observations sur les maladies du gibier, des oiseaux et des poissons faites en 1955 et 1956. **[Observations on diseases of game, birds and fish, during 1955 and 1956.]** — *Schweiz. Arch. Tierheilk.* **99,** 461-477. [In French.] **2262**

The authors described the result of some 725 examinations on wild animals as follows:—

Ibex. Two young beasts died from intestinal catarrh, one due to *Clostridium welchii*; two were affected with intestinal coccidiosis and three adults had strongylosis of the abomasum. The last-named disease can be fatal in these animals. There was one accidental abortion with secondary endometritis.

Deer. One case of congenital microphthalmia was diagnosed in a young deer. Apart from this all deaths were accidental, occurring after heavy falls of snow.

Chamois. The following diseases were noted: verminous bronchitis, strongylosis of the abomasum or intestine, coccidiosis and injuries; specific diseases were contagious ecthyma and kerato-conjunctivitis.

Roedeer. The majority had died from accident. There were also cases of gastro-enteritis, nematodiasis of lungs and gastro-intestinal tract and parasitism of the nasal passages. Nasal myiasis due to *Cephenomyia* occurred; one larva had entered the eustachian tube and death occurred from the rupture of a blood vessel. There were also cases of *Cysticercus cervi*, tuberculosis and actinomycosis.

Hares. Parasitism with *Dicrocoelium lanceolatum* and with *Fasciola hepatica* was frequent. Death in these cases occurred from cirrhosis of the liver. The following infectious diseases were found amongst hares: 65 cases of pseudotuberculosis (*Pasteurella rodentium*), 10 of pasteurellosis, 21 of staphylococcal infections, 15 of brucellosis (*Brucella suis*), one of salmonellosis and one of erysipelas (*Erysipelothrix rhusiopathiae*). There were also 20 cases of toxoplasmosis. Amongst various carnivores the following occurred: Nicotine poisoning in a stone marten. Tuberculosis in foxes and subcutaneous filaria in badgers. *Echinococcus granulosus* and also sarcoptic mange in foxes. Coccidiosis and infection due to *Pasteurella septica* in squirrels. In various birds the following were seen: *Salmonella typhi-murium*, coccidiosis, syngamus, various forms of poisoning, tuberculosis, worm infestation, pasteurellosis, paralysis of the legs and various bacterial diseases.—R. N. Fiennes.

Agrimi, P. (1957). Ricerche sulla presenza di anticorpi anti Rickettsia burneti ed antibru-

cellari in sieri di ovini. **[Presence of Q fever and brucella antibodies in ovine serum.]**—*Zooprofilassi* **12**, 325-332. **2263**

Serum samples from 586 sheep were subjected to the c.f. test for Q fever and to agglutination tests for brucellosis. Of 42 samples which gave a positive reaction to the c.f. test for Q fever six gave positive reactions to Renoux's agglutination test; all gave negative reactions to the standard tube agglutination test.

—T.E.G.R.

I. JARRETT, W. F. H. (1956). **Bovine hepatic disease.**—*Vet. Rec.* **68**, 825. **2264**

II. SEARLE, M. (1956). **Bovine hepatic disease.**—*Ibid.* 1044. **2265**

I. Telangiectasis—wrongly called cavernous angioma of the liver—is a replacement and displacement of hepatic parenchyma by blood-filled spaces. It has been shown in the U.S.A. to be associated with the feeding of beef cattle on a ration with a high ratio of concentrates to roughage. The severity of the lesion depends upon the time spent on such a diet. The early lesion consists of an accumulation of glycogen between the hepatic cell and the sinusoidal endothelium. When the glycogen penetrates the sinusoid its place is taken by blood which erodes the hepatic cell column. There is some evidence that the absorption of hydrogen sulphide from the bowel may be responsible for the lesion.

Necrobacillosis lesions due to *Fusiformis necrophorus* are also associated with feeding of beef cattle in "feedlots". It is considered to be related to rumenal ulceration and rumenitis.

II. A brief note on two cases of *F. necrophorus* infection, both on the same farm, with an interval of two years. During life the animals coughed up large quantities of blood. The primary lesions were considered to be in the liver, with secondary infection in the hepatic vein and emboli in the lungs.—W.A.P.

NUMANS, S. R. & WINTZER, H. J. (1958). Gedeckte Klauenbeinfrakturen während des Weideganges beim Rind. **[Simple fractures of the third phalanx in cattle at pasture.]**—*Dtsch. tierärztl. Wschr.* **65**, 201-204. [English summary.] **2266**

The authors encountered 52 fractures and fissures of the third phalanx during 5 years. All cases occurred during the pasturing period, mostly in May and June. Diagnosis was only possible by X-ray. There was no effective treatment: the fractures healed spontaneously within 1 or 2 months even when the joint was involved. It was suggested that such fractures were a much commoner cause of lameness than hitherto believed.—R.M.

SALISBURY, R. M. (1957). **Enzootic pneumonia of sheep in New Zealand.**—*N. Z. vet. J.* **5**, 124-127. [Author's summary modified.] **2267**

A distinct clinical entity, an enzootic pneumonia in sheep in southern Otago and Southland, is described. P.M. and histological findings are given. Bacteriological findings and transmission tests did not reveal a primary pathological agent. Penicillin and sulphadimidine were used on a limited scale with encouraging results. The possibility of it being a virus condition is discussed.

BUGEAC, T., BERBINSCHI, C., CRISTESCU, M. & SOLNITZKY, A. (1958). Studii asupra rinitei atrofice infectioase a porcului in R. P. R. (Comunicarea A II-a.) **[Porcine atrophic rhinitis in Roumania. II.]**—*Anu. Inst. Pat. Igien. anim.* **7**, 255-264. [In Roumanian. Summaries in French and Russian.] **2268**

Infectious material (1 g. of a mixture of nasal secretion and triturated respiratory mucous membrane) became avirulent after contact for 30 min. with 4000 i.u. penicillin, 10 μg. streptomycin and 10 μg. chlortetracycline at room temp. Infectious material kept for 48 hours at either 37° or −20°C. retained its virulence for pigs. Sodium merthiolate at a conc. of 1 : 100,000 did not reduce the virulence of the material after 48 hours at room temp. [For Part I, see *V.B.* **27**, 557.]—R.M.

AUSTVOLL, J. (1957). **Gut oedema in a litter of four-day-old pigs.**—*Vet. Rec.* **69**, 104. **2269**

A brief note reporting gut oedema in a 4-day-old litter of 11 piglets. All except two died within four days. At the same time and on the same premises two litters of 14-day-old piglets were also affected with the disease.—W.A.P.

THIEME, E. (1957). Nebennieren und Hypophysenbefunde beim sog. Herztod der Schweine. **[Examination of the adrenal and pituitary glands in fatal syncope of pigs.]**—*Mh. VetMed.* **12**, 179-181. **2270**

Changes indicating hypofunction of the adrenals were found in 46 pigs which had died from fatal syncope. Most of the 23 pituitaries examined had an increase in the number of basophile cells and a decrease in chief cells and eosinophiles. No changes were seen in the brain stem and medulla. It is concluded that fatal syncope is a metabolic disorder leading to exhaustion of the adrenals. [See also *V.B.* **25**, 1467.]—M.G.G.

CATELLANI, G. (1957). Contributo allo studio della cistite cronica follicolare del cane. **[Chronic follicular cystitis in the dog.]**—*Acta med. vet., Napoli* **3,** 211-224. [English, French and Italian summaries.] **2271**

The histological changes associated with chronic follicular cystitis in dogs were studied. These were characterized by subepithelial lymphatic follicles in various stages of development, from simple irregular masses of lymphatic cells to proper follicles with a clear centre, a fine network and newly formed blood vessels. The lymphatic masses are accompanied by chronic cystitis. It is considered that these lesions are caused by long standing inflammatory processes of an infective or toxic nature.

—T.E.G.R.

HELMBOLDT, C. F. & JUNGHERR, E. L. (1958). **The pathology of aleutian disease in mink.**—*Amer. J. vet. Res.* **19,** 212-222. **2272**

The authors describe the course and pathology of the so-called Aleutian disease in mink as seen in a very severe outbreak in Connecticut. The disease is essentially a hepato-nephritis characterized by widespread and severe round-cell infiltrations. Other organs and in particular the arteries may also be affected. The course varies from a few days to weeks, or even months. About 90% of the affected animals died within a month; some which appeared to recover often died at a later date. Extensive studies to discover the cause were unsuccessful. No evidence could be found of infection with *Leptospira, Erysipelothrix* or other bacteria or viruses. Poisonous substances were not found in contents of liver and stomach. Animal inoculation studies were unsuccessful in all animals except mink. It is claimed that the disease was transmitted to other healthy Aleutian mink by inoculation i/p of liver and kidney substance from the infected animals. No treatment was effective during the course of the disease.

—R. N. FIENNES.

ZOLETTO, R. (1957). Osservazioni sulla cosidetta gangrena alare dei pulcini. **[Gangrene of the wings in chicks.]**—*Vet. ital.* **8,** 444-446. **2273**

The designation "gangrene of the wings" is not considered appropriate because the lesions are not restricted to the wings but occur on other parts of the body as well. *Staphylococcus aureus* was isolated from all of 28 cases investigated. Intracardiac inoculation of this organism caused the death of test birds but did not set up the characteristic lesions. The feeding of broth cultures of the organism yielded no results. The aetiology and pathogenesis of the condition are obscure. However, it is considered that a high protein content in the diet, the feeding of antibiotics (which favour the growth of staphylococci by inhibiting some of the intestinal microflora), unhygienic conditions, coccidiosis and other infections are important contributory factors. [See also *V.B.* **26,** 2820; **27,** 1325.]

—T.E.G.R.

SMITH, A. H., ABBOTT, U. K. & JONES, M. E. (1958). **Effect of artificial changes in egg composition on hatchability and chick growth.** —*Proc. Soc. exp. Biol., N.Y.* **97,** 17-20. [Authors' summary modified.] **2274**

Artificial decrease in albumen quality and quantity caused by local X-irradiation of the oviduct reduced the hatchability of eggs. The distribution of embryo mortality differed from that in normal eggs: very early mortality was markedly increased. Chicks from such eggs had a lower hatching weight; however, no effect on subsequent chick growth was observed.

ARNALL, L. (1958). **Experiences with cage-birds.** — *Vet. Rec.* **70,** 120-128. [Author's summary modified.] **2275**

Diseases of 435 cagebirds and other pet birds were classified. Aetiology, nature, diagnosis, treatment and outcome were discussed. The paper included notes on the general handling of these birds.

WEISS, H. S. & SHEAHAN, M. (1958). **The influence of maturity and sex on the blood pressure of the turkey.**—*Amer. J. vet. Res.* **19,** 209-211. [Authors' summary modified.] **2276**

There were no differences in blood pressure between the sexes in 6 to 7-week-old Jersey Buff poults. The following averages were established: systolic 193, diastolic 150, pulse pressure 43, and heart rate 306. Systolic pressure of the 8 to 9-month-old adult was higher (226 in the male) and heart rate lower than in the poult. The pulse pressure of the adult male (75) was higher than that of the female (55), whereas the heart rate of the female (195) was higher than that of the male (144). Blood pressures for turkeys were higher, in general, than those reported previously for fowls, ducks and pigeons. The adult male pressure pattern appeared to reflect decreased arterial distensibility, such as might be expected with aortic atheromatosis. The elevated pressures, in turn, could initiate spontaneous aneurysms and ruptures of the atherosclerotic vessels.

I. ASHTON, G. C. (1957). **Zone electrophoresis of mammalian sera in starch gels.**—*Nature, Lond.* **179,** 824-825. **2277**

II. LATNER, A. L. & ZAKI, A. H. (1957). **Starch-gel electrophoresis of animal sera.** — *Ibid.* **180,** 1366-1367. **2278**

I. Ashton studied serum proteins of horse, cow, pig and dog by starch gel electrophoresis as described by Smithies [*Biochem. J.* **61,** 629, (1955)]. Different electrophoretic patterns were obtained for each species.

II. The species-specific nature of electrophoretic patterns in starch gel was confirmed and illustrated.—R.M.

ROSENFELD, G. (1958). **Functional studies of the calf adrenal cortex following total-body exposure to a single lethal dose of gamma-radiation.** — *Amer. J. Physiol.* **192,** 232-240. **2279**

Adrenocortical dysgenesis did not occur after exposure to 600 r whole-body gamma-radiation despite death of the animal from radiation sickness characterized by generalized sepsis, toxaemia, haemorrhage, and anaemia. —R.M.

EDMONDSON, P. W. (1958). **Chronic gamma irradiation. Effects on the peripheral blood and haemopoietic system of female guinea-pigs.**—*Brit. med. J.* February 15th, 363-368. [Author's summary modified.] **2280**

In female g.pigs irradiated at 10 r daily until they died (after about 178 days), peripheral blood examination revealed irradiation injury in the total white cell counts and platelet counts; only terminally was any significant change found in the erythrocyte evaluations. The author described a hitherto unreported pattern of platelet response. Neither single nor repeated marrow smears gave a reliable indication of the degree of irradiation injury or the imminence of death. No failure of erythropoiesis or erythrocyte maturation was observed. Death was considered to be due to anaemia consequent upon thrombocytopenia and haemorrhage.

ABRAHAMS, A., HARRIS, S. J., PAUL, I. & PAUL, G. W. (1957). **Radiological hazards due to exposure to low-energy radiation in veterinarians: an environmental study.**—*Vet. Med.* **52,** 235-240. **2281**

A study of the hazards arising from the use of X-ray apparatus. The maximum amount of radiation which would not endanger health was put at 0·3 r a week. This was equivalent to exposure of the torso to scattered rays for 20 min. or exposure of the hands to direct rays for 3·2 sec. The particular hazard of fluoroscopy was stressed.—R.M.

BROOME, A. E. (1958). **How dangerous are X-rays?** — *Canad. J. comp. Med.* **22,** 24-29. **2282**

Radiation hazard to the operator, his assistants, and patients is discussed. Damage may manifest itself in one or in any combination of the following conditions: premature senescence, leucaemia, osteogenic malignancy, radiodermatitis. Choice of apparatus and personal technique are considered with a view to minimizing risk from exposure to radiation.—T.E.G.R.

DETWEILER, D. K. (1957). **Electrocardiographic and clinical features of spontaneous auricular fibrillation and flutter (tachycardia) in dogs. Comparison with spontaneous auricular fibrillation and flutter in other species and with experimentally induced arrhythmias in dogs.** —*Zbl. VetMed.* **4,** 509-556. [In English. German, French and Spanish summaries.] **2283**

Spontaneous auricular fibrillation was diagnosed in 22 of 39,000 dogs examined at the Pennsylvania School of Veterinary Medicine over 7 years. D. described in detail symptoms, electrocardiography, treatment and pathology. —R.M.

ALIEV, A. A. (1958). **[Influence of proserine on motor function of the digestive tract of sheep.]** — *Sechenov. J. Physiol.* **44,** 57-59. [In Russian. English summary.] **2284**

Proserine (neostigmine) was inj. s/c in 30 experiments on 3 rams having double external enterostomy. The maximum dose which elicited a physiological response was 600 μg./kg. body wt. A dosage of 500–600 μg./kg. was recommended for the treatment of atony of the digestive tract in ruminants.—R.M.

POULSEN, E. (1957). **Renal clearance in the cow.**—*K. VetHøjsk. Aarsskr.*, 1957 pp. 97-126. [In English. Author's summary modified.] **2285**

The animals used in the experiments included 21 non-pregnant and non-lactating Red Danish cows, aged 3–10 years. In three cows renal melanosis was found after slaughtering. In one cow, an apparently healed interstitial nephritis of the left kidney was found by histological examination. The cow had normal clearance values.

The experiments were carried out on unanaesthetized animals in the standing position. The urine was collected by using a balloon catheter and the bladder washed out with saline solution and air. Blood samples were taken through a permanent cannula in the jugular vein using a plastic catheter. Diuresis was varied by

regulation of water intake. In calculating plasma concentration, corresponding to the period of urine flow a "delay time" of 6 min. was assumed.

Experiments with ultrafiltration of plasma through a cellophane membrane revealed that inulin was only partially filtrable and thiosulphate, urea and "creatinine" were completely filtrable.

BOST, J. & BLANDIN, J. (1958). L'épreuve de Thorn, chez le chien normal. **[A test for adrenal cortical function in dogs.**—*Rev. Méd. vét.* **109,** 146-152. [English summary.] **2286**

The authors applied to dogs the test for adrenal cortical insufficiency described by Thorn *et al.* for use in man [*J. Amer. med. Ass.* **137,** 1005 (1948); see also *V.B.* **25,** 1516]. An i/m inj. of 10 i.u. corticotrophin caused eosinopenia in ten healthy starved dogs, with greatest effect 7 hours after injection.—R.M.

See also abst. 2379 (advances in veterinary science).

POISONS AND POISONING

KRAMER, W. (1957). Necrotische myelopathie t. g. v. loodintoxicatie bij een hond. **[Necrotic myelopathy in a dog due to lead poisoning.]** — *Tijdschr. Diergeneesk.* **82,** 411-421. [In Dutch. English, French and German summaries.] **2287**

Acute gastro-intestinal disturbances developed in a dog after ingestion of grass contaminated with red lead. This was followed by paralysis of all four legs with spread from posterior to anterior. Examination of the nervous system revealed myelitis and increased number of cells in the cerebrospinal fluid, characteristic of subacute necrotic myelopathy. There was an abnormal amount of lead in the nervous system (390 μg./100 g. of spinal cord, 80 μg./100 g. brain).—R.M.

OLSON, L. E., NIELSEN, H. M., SHUPE, J. L. & GREENWOOD, D. A. (1958). **Variations in serum alkaline phosphatase of cows on high fluoride diets.**—*J. Pharmacol.* **122,** 58A. **2288**

Cows were fed 25, 50 or 100 p.p.m. fluorine as sodium fluoride for 5 years. No correlation was found between the amount of fluoride fed and the concentration of alkaline phosphatase, calcium or inorganic phosphorus in the blood serum. The inhibition of alkaline phosphatase and other enzymes by the fluoride ion has been reported by other investigators, presumably using lab. animals.—R.M.

SHARAF, A. & MIKHAIL, T. (1957). **Toxicity of selenium dioxide in dogs.**—*Vet. med. J., Giza* **3,** No. 3. pp. 3-16. [In English.] **2289**

A study of the acute toxicity of selenium dioxide in dogs injected i/m as a 10 mg./ml. aqueous soln. The minimum lethal dose was 2·2 mg./kg. body wt.—R.M.

PALMER, I. S. & BONHORST, C. W. (1957). **Modification of selenite metabolism by arsenite.** — *J. agric. Fd Chem.* **5,** 928-930. [Authors' summary modified.] **2290**

Arsenite injected into rats apparently blocked the transport of selenite from the blood to the liver. Selenite uptake by the kidney and spleen appeared to be unaffected by arsenite, indicating that arsenite lowers selenite toxicity by its blocking action, and that the efficacy of arsenic in preventing selenium poisoning is related to the concentration of arsenite maintained in the blood.—M.G.G.

CROWSON, C. N. & KING, J. B. (1957). **Glomerulotubular nephrosis correlated with hepatic lesions. IV. An agonal-phase histoangiographic technique for serial-time hepatic and renal angiohistologic studies and its application in mercuric chloride poisoning.**—*Arch. Path.* **64,** 607-613. [Authors' summary modified.] **2291**

The authors described a microangiographic technique employed during the agonal phase in the rat. The method could be adapted to both direct photography on cleared unstained tissues and to radiography on sections or whole organs and could be used in conjunction with histological studies. They described the application of agonal-phase angiography to studies of the renal and hepatic vascular lesions in mercuric chloride poisoning. The results compared favourably with those obtained by fluorescent angiography *in vivo*.

SMITH, D. L. T. (1957). **Poisoning by sodium salt—a cause of eosinophilic meningoencephalitis in swine.**—*Amer. J. vet. Res.* **18,** 825-850. **2292**

A detailed account of experimental sodium chloride poisoning in 17 pigs, with 20 photomicrographs mainly of brain lesions. The typical syndrome was not produced by i/v inj. of 20% saline, but only by feeding salt (*e.g.* 2·5% salt in swill) and restricting water intake. In general S. confirmed the findings of Done *et al.* [*V.B.* **27,** 2159].—R.M.

MENEELY, G. R., BALL, C. O. T. & YOUMANS, J. B. (1957). **Chronic sodium chloride toxi-**

city: the protective effect of added potassium chloride. — *Ann. intern. Med.* **47,** 263-273. **2293**

Rats fed toxic amounts of NaCl for 20–30 months lived several months longer if the diet contained 2·5–5% potassium chloride. The latter reduced the hypertension caused by chronic salt poisoning.—R.M.

BULL, L. B., DICK, A. T. & MCKENZIE, J. S. (1958). **The acute toxic effects of heliotrine and lasiocarpine, and their *N*-oxides, on the rat.**—*J. Path. Bact.* **75,** 17-25. [Authors' summary modified.] **2294**

Heliotrine and lasiocarpine [alkaloids from *Heliotropium europaeum*] and their *N*-oxides had a specific primary toxic action on the liver cell, and produced necrosis with a secondary haemorrhagic extravasation in the liver. The early necrotic effect was centrilobular with heliotrine, but midzonal with lasiocarpine and its *N*-oxide. The early toxic action was manifested by a temporary loss of mitochondrial staining and a fine fatty metamorphosis. The ribonucleic acid content of the cell was not affected early. A striking feature was the formation of large numbers of protein inclusion globules which decreased appreciably towards the terminal stages. There was a wide difference in susceptibility between the sexes to heliotrine and to lasiocarpine *N*-oxide, and a narrower range of individual susceptibility to each of the four substances. The final pathological changes at death depended largely on survival time of the individual rat, which varied with dose and susceptibility.

LALICH, J. J., BARNETT, B. D. & BIRD, H. R. (1957). **Production of aortic rupture in turkey poults fed beta-aminopropionitrile.**—*Arch. Path.* **64,** 643-648. [Authors' summary modified.] **2295**

Fifteen of 77 poults that were fed varying concentrations of β-aminopropionitrile hydrochloride in the diet developed rupture of the abdominal aorta. No such lesion developed in 23 controls. The perforations were associated with fragmentation of elastic fibres and dissecting medial haemorrhages. The turkey is more susceptible to aortic rupture than the rat, requiring 4–8 times less of the compound in the diet to produce the lesion. It is of considerable interest that diffuse or localized intimal fibrous thickening was observed in 5 of the controls.

PARRISH, H. M., SCATTERDAY, J. E. & POLLARD, C. B. (1957). **The clinical management of snake venom poisoning in domestic animals.**—*J. Amer. vet. med. Ass.* **130,** 548-551. **2296**

Antihistamine drugs and cortisone were of no value in reducing mortality from snake bite in dogs. A polyvalent anti-snake bite serum, effective against American pit vipers, was commercially available. [See also *V.B.* **27,** 1892].
—R.M.

ROGERS, R. L., BROOKS, F. N. & HIGGS, B. F. (1957). **Toxicological studies following massive dose of phenothiazine to a calf.** — *Vet. Med.* **52,** 219-224. **2297**

A calf received 436·5 g. of purified phenothiazine at a rate of 162·68 g. per 100 lb. body wt. or 16 times the normal dose. Four hours later it was drowsy and showed incoordinated movements, at 8 hrs. 25 min. it collapsed and during the next 3 hrs. had 3 attacks of clonic spasms lasting 3–5 min. each. It was depressed and in a semi-comatose condition. At 25½ hrs. feeble attempts to rise were made and at 28¾ hrs. it stood, held its head normally, drank and ruminated. At 69 hrs. it refused food and drank only sparingly, remaining recumbent and acting as if intoxicated. The motility of the alimentary canal was but slight. These delayed symptoms were suggestive of gastro-intestinal intoxication and at 97½ hrs. the following treatment was given: 250 ml. 5% glucose, 250 ml. normal saline, 3 ml. of a proprietary liver concentrate and 3 ml. injectable vitamin B complex i/v; 2 ml. of water-soluble glyceride of cascara i/m; and 4 oz. of a solution of 5% glucose in normal saline orally and rectally, repeated every 2 hours. The calf responded by eating, ruminating, standing and urinating but defaecation did not occur.

At 122 hrs. the animal arose unassisted and the above treatment was again given with the exception of the liver concentrate. One tablespoonful of dry, conc. rumen inoculant was given. The calf ate hay and drank but was still constipated. At 144 hrs. the general condition was improved but since phenothiazine may be bactericidal or bacteriostatic 24 oz. of strained rumen fluid was given 30 min. after its collection from an abattoir. Further glucose and saline was given orally and rectally. Gradually improvement occurred, appetite returning to normal. At 200 hrs. observation ceased. The calf lost 33 lb. during the period. Temperature varied from 100·8° to 103·1°F.

Phenothiazine did not significantly alter blood values and no evidence of haemolysis was seen. Data are presented on the recovery of phenothiazine from the faeces and urine showing a recovery of 97·71% of the original dose. No

permanent damage resulted as indicated by subsequent weight gains and continued growth.
—D. Poynter.

Williams, M. W., Fitzhugh, O. G., Cook, J. W. & Frawley, J. P. (1958). **Parathion-induced changes in the serum proteins of the dog.**—*J. Pharmacol.* **122.** 83A-84A. **2298**

Four dogs were fed 100 p.p.m. parathion in the diet for 9 weeks. After 3 weeks the amount of cholinesterase in plasma and erythrocytes was reduced by 80%. There was a fall in the relative albumin concentration and a rise in beta globulins.—R.M.

Poulsen, E. (1958). Lindanafsmag i aeg. [**Lindane taint in eggs.**]—*Medlemsbl. danske Dyrlaegeforen.* **41,** 216-219. [In Danish.] **2299**

Eggs laid by pullets fed seed barley dressed with lindane either dry (200 g. 20% or 80% lindane per 100 kg. seed) or in acetone solution were sampled for tainting together with eggs laid by controls fed undressed barley. Each of the 6 birds in 4 groups was given about 60 g. barley a day. Tainting was not detected when the eggs were fried, and only slightly in the raw eggs, but after 3–4 weeks a pronounced taint ("mouldy" or "metallic") was detected after light cooking, especially in the yolk. The period which elapsed before the taint appeared corresponded roughly with the period needed for the yolk to form in the ovary. The conc. of lindane used influenced the length of this period. Dressed seed-corn should not therefore be fed to laying fowls.—F.E.W.

Ortega, P., Hayes, J. W., Jr. & Durham, W. F. (1957). **Pathologic changes in the liver of rats after feeding low levels of various insecticides.** — *Arch. Path.* **64,** 614-622. [Authors' summary modified.] **2300**

In order to reinvestigate the minimal dietary levels of certain chlorinated hydrocarbon insecticides required to produce pathological change, materials were fed to rats at the following concentrations: chlordane, 2·5 and 25 p.p.m.; dieldrin, 2·5 and 25 p.p.m.; lindane, 50 and 100 p.p.m.; and toxaphene, 50 and 200 p.p.m. The control diet contained less than 0·6 p.p.m. of D.D.T. as the only known contaminating insecticide. The test animals were studied clinically and then serially killed after from two to nine months' exposure to the poison. Tissues from liver, kidney, and spleen were examined histologically. Clinical toxicity was minimal. Histological findings were confined to cytoplasmic alterations of liver cells.

New findings were that the following low dietary levels occasionally produced liver-cell changes: dieldrin (2·5 p.p.m.), lindane (50 p.p.m.), and toxaphene (50 p.p.m.). The previously reported minimal level for chlordane (2·5 p.p.m.) was confirmed. The improvement in the sensitivity of the test was ascribed, at least in part, to the use of characteristic fatty inclusion bodies, lipospheres, as a measure of subtle cytoplasmic change. Incidental pathological findings suggested the possibility of changes in the permeability of sinusoidal endothelium and the liver cell itself.

See also abst. **2372** (C.S.I.R.O. report, Australia).

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease)

—. (1958). **British pharmacopœia 1958.** pp. xxvi + 1012. London: Pharmaceutical Press. 63s. **2301**

This new edition contains 160 new monographs not in the 1953 B.P. or the Addendum published in 1955. Additions include aluminium hydroxide gel, erythromycin, hydrocortisone, oxytetracycline, piperazine compounds, prednisolone, prednisone, pyrimethamine, sodium radio-iodide, sodium radiophosphate, tetracycline. These gains are roughly balanced by deletions, and some old favourites have now disappeared from the B.P.: Arsenical solution (Fowler's Soln.), carbon tetrachloride, mercuric chloride, quassia, serum gonadotrophin, sulphanilamide and sulphathiazole. Latin names are only given when they differ greatly from the English names. Imperial weights and measures are being rapidly replaced by the metric system, and it is anticipated that the metric system alone will be used for the next edition of the B.P. There has been a useful simplification of titles so that 'Neostigmine Injection' replaces 'Injection of Neostigmine', 'Ergometrine Tablets' replaces 'Tablets of Ergometrine Maleate' and so on. The new B.P. has undergone many changes in order to keep pace with the rapid developments in Therapeutics, and it is to be hoped that the British Veterinary Codex will soon follow suit.—R.M.

Humphrey, J. H., Lightbown, J. W. & Mussett, M. V. (1957). **International standard for tetracycline.** — *Bull. World Hlth Org.* **17,** 521-526. [French summary. Authors' synopsis.] **2302**

The International Standard for Tetracycline is a highly purified preparation of tetracycline

hydrochloride. It was compared in a collaborative assay by 8 laboratories in 7 countries, with the working standard of the Food and Drug Administration of the U.S. Department of Health, Education, and Welfare. On the basis of the results the International Unit for Tetracycline is defined as the activity contained in 0·00101 mg of the International Standard for Tetracycline, and is as nearly as possible equivalent to the activity of 1 μg of pure tetracycline hydrochloride.

HUMPHREY, J. H., LIGHTBOWN, J. W. & MUSSETT, M. V. (1957). **International standard for erythromycin.**—*Bull. World Hlth Org.* **17,** 527-535. [French summary. Authors' synopsis modified.] **2303**

A batch of highly purified erythromycin A was examined by 9 laboratories in 6 countries, and assayed against the U.S. standard of the Food and Drug Administration of the U.S. Department of Health, Education and Welfare. The material examined was established as the International Standard for Erythromycin and the International Unit of Erythromycin is defined as the activity contained in 0·001053 mg. of the International Standard. The International Unit is, for practical purposes, equivalent to 1 μg. of pure erythromycin base.

RUEBNER, B. & MCLAREN, J. R. (1958). **The effect of oxytetracycline and neomycin on ammonia levels in the mesenteric vein and on the caecal flora in rabbits.**—*Brit. J. exp. Path.* **39,** 85-89. [Authors' summary modified.] **2304**

The mean concentration of ammonia in the mesenteric vein of rabbits given oxytetracycline was only about a third of that in control rabbits. No significant change occurred in animals given neomycin. The predominant organisms isolated from caecal aspirates of the controls were anaerobic bacilli of the *Bacteroides* group. These were absent in the rabbits given oxytetracycline but not in those given neomycin. It is concluded that the production of ammonia, which is toxic to patients with cirrhosis of the liver, can be lowered but not abolished by intestinal antibiotics. The importance of ammonia production by anaerobic intestinal organisms, particularly the *Bacteroides* group, is emphasized.

FUSILLO, M. W., WEISS, D. L. & POSSEHL, C. D. (1957). **Mg++ inactivation of antibiotics. I. Clinical laboratory applications and theoretical interpretations regarding antibiotic synergy.**—*Amer. J. clin. Path.* **27,** 534-538. [Interlingua summary.] **2305**

The inhibitory activity of streptomycin, neomycin, the three tetracyclines and polymyxin was cancelled by the addition of 48 mg. of Mg^{++} per 100 ml. of trypticase soya broth and also by the addition of 2 ml. of a sterile 1 M soln. of $MgSO_4$ to the broth. It is considered that it may be possible to explain antibiotic synergy on the basis of these results.—T.E.G.R.

CEDRANGOLO, F. (1957). Antitoxische Wirkung von Glutaminsäure in Bezug auf Isoniazid. **[Antitoxic action of glutamic acid with respect to isoniazid.]**—*Enzymologia* **18,** 366-370. [In German. English summary modified.] **2306**

The lethal effect of isoniazid is due to ammonia split off from the drug in the tissues (especially in nervous tissue, and also in kidney, liver and muscle). A diet containing 0·1% isoniazid produced in rats symptoms of hepatic dysfunction which disappeared when 10 parts of glutamic acid for each part of isoniazid were added to the diet. It is concluded that glutamic acid acts through the enzymic formation of glutamine.

FISHER, E. W. & JENNINGS, S. (1957). **A closed circuit anaesthetic apparatus for adult cattle and for horses.**—*Vet. Rec.* **69,** 769-771. **2307**

The distinguishing feature of the apparatus was the use of 1½-inch diam. tubing throughout, in order to provide airways adequate for large animals. Using the apparatus it was possible to maintain surgical anaesthesia in horses with ether, after induction with thiopentone.—R.M.

SHALDUGA, N. E., VOSKOBOINIKOV, V. M. & KOMPANTSEV, V. A. (1957). **[Intraosteal and intravenous anaesthesia of pigs with alcoholic solution of chloral hydrate.]** — *Veterinariya, Moscow* **34,** No. 7. pp. 63-64. [In Russian.] **2308**

For intravenous or intraosteal injection a 20% soln. of chloral hydrate in 33% ethyl alcohol was prepared. Dosage was 0·1 g. chloral/kg. body wt. Intraosteal injections were made into the second segment of the sternum or the proximal epiphysis of the humerus. The authors claimed that the technique of injection was easier and more suitable for pigs than i/v inj. Narcosis commenced 3–6 min. after inj. and lasted for 15–60 min. or longer in old pigs. 213 pigs were anaesthetized with the alcoholic chloral soln. without complications.—R.M.

See also absts. **2067** (antibiotics against foot rot in sheep); **2070** (bactericidal effect of antibiotics); **2071** (problems associated with antibiotics); **2072** (susceptibility of enterococci and haemolytic streptococci to antibiotics); **2080** (Trichophyton); **2091** (diamines against E. histolytica and T. cruzi); **2093-2096** (trypanocides); **2097** (piroplasmosis); **2107-2108** (cortisone and immunity to anaplasmosis); **2177-2179** (cortisone in murine typhus); **2194** (endoparasiticide); **2196-2197** (Dow ET-57); **2203-2207 & 2214** (anthelmintics).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

TANEJA, G. C. (1958). **Sweating in cattle. I. Cutaneous evaporative losses in calves and its relationship with respiratory evaporative loss and skin and rectal temperature.**—*J. agric. Sci.* **50**, 73-81. [Author's summary modified.] **2309**

Three calves (Australian Illawarra Shorthorn, Shorthorn, and zebu × Australian Illawarra Shorthorn), 2–3 months old, were exposed to different combinations of wet- and dry-bulb temperatures in a psychrometric chamber, cutaneous and respiratory water losses, and skin and rectal temperatures being recorded.

Cutaneous water losses in all the animals increased with increases in air temp. Comparison of these results with those on men with congenital absence of sweat glands exposed to high air temp. below the sweat point, suggested that the cutaneous evaporative losses in cattle were more than those that can be accounted for by diffusion-moisture alone.

Increase in cutaneous evaporation under hot conditions is accompanied by increase in skin and rectal temperatures. In the zebu cross, however, the skin temp. did not rise with rise in air temp.

Keeping the humidity constant, rise in dry-bulb temp. caused increase in respiratory water loss. On the other hand, rising humidity at a constant dry-bulb temp. resulted in decrease in respiratory evaporation. Respiratory evaporative loss was, therefore, greater in hot-dry than in hot-wet conditions.

In animals with lower rectal temp. and higher tidal volumes the dry- and wet-bulb temperatures of the expired air were lower. These differences were, however, not large enough to cause the large differences amongst animals in the vapour pressures of their expired air. Animals with higher respiratory volumes had greater respiratory evaporative losses.

With increase in the age of the animals, the cutaneous evaporation increased, but the respiratory evaporation remained nearly the same at all ages. Therefore, of the two sources of evaporative cooling—respiratory and cutaneous—respiratory cooling contributed practically nothing towards the higher heat tolerance in the older animals.

In all these animals, when the rectal temp. reached approx. 105°F. there were obvious signs of sweating.

WILDMAN, A. B. (1957). **Photoperiodicity and wool growth in Romney rams and wethers.**—*Nature, Lond.* **180**, 296-297. **2310**

Two groups, each of 6 Romney Marsh male sheep, were kept indoors in Scotland from June 1955 until October 1956; the control group experienced natural solar light–darkness rhythms throughout and the experimental group in an adjacent blacked-out room were subjected to a continuous 2:1 rhythm of 8 hours darkness to 4 hours light supplied by two 100-watt lamps. Wool was cut from each of 4 tattooed areas on each sheep every 2 months. The experimental group consistently produced a significantly greater weight of wool than that grown by the controls, reaching a peak of 48% more wool during March–May 1956. The margin then gradually reduced until October 1956 when all the sheep were put out of doors; there was then a rapid increase in the amount of wool grown by the experimental animals, about 50% more than the controls, in the period October–December.

—E.V.L.

ALEXANDER, F. & CHOWDHURY, A. K. (1958). **Enzymes in the ileal juice of the horse.**—*Nature, Lond.* **181**, 190. **2311**

The following enzymes were present in most of 19 samples of ileal juice collected from a Thiry-Vella fistula in a horse: amylase, sucrase, lactase, maltase, protease, peptidase. Lipase was absent.—R.M.

I. LEWIS, C. J., HARTMAN, P. A., LIU, C. H., BAKER, R. O. & CATRON, D. V. (1957). **Digestive enzymes of the baby pig. Pepsin and trypsin.**—*J. agric. Fd Chem.* **5**, 687-690. **2312**

II. HUDMAN, D. B., FRIEND, D. W., HARTMAN, P. A., ASHTON, G. C. & CATRON, D. V. (1957). **Digestive enzymes of the baby pig. Pancreatic and salivary amylase.**—*Ibid.* 691-693. [Authors' summaries modified.] **2313**

I. The relative proteolytic activities of the gastric mucosa and pancreas of the piglet were estimated from birth to 6 weeks of age. Although there was a rapid initial development of pepsin during the first week, which lessened as age increased, the concentrations of pepsin per unit of tissue were low until the third to fourth week of age. An apparent increase, with age, in the quantity of trypsin was due to increased size of the pancreas, but no definite increase was noted per unit of pancreatic tissue. The relationship of these results to recent research in pig nutrition is discussed.

II. The pancreatic tissues of pigs, from 1 to 42 days of age, were examined for amylase and maltase activity. Total amylase activity increased from 1 to 35 days of age. The maltase activity per g. of dry pancreatic tissue was so

low that the role of pancreatic maltase in the piglet is probably of little significance. The saliva of the piglet, from 1 to 49 days of age, was comparatively low in amylase.

EVANS, J. V. (1957). **Water metabolism in the sheep.**—*Nature, Lond.* **180,** 756. **2314**

There was considerable variation in the water metabolism of individual sheep. Potassium content of erythrocytes was one of the factors responsible for variation. It was suggested that a study of the inheritance of factors governing water metabolism would be of value in relation to the keeping of sheep in arid environments.
—R.M.

LABOUCHE, C. (1957). La physiologie de la lactation en milieu tropical. II. Influence de la saison sur la vitesse de chute de la production laitière (observations recueillies en zone subguinéenne de la presqu'île du Cap Vert). [**Physiology of bovine lactation in a tropical climate. II.**]—*Rev. Élev.* **10,** 249-256. [English summary. For Part I, see *V.B.* **28,** 1240.] **2315**

The rate of fall in milk yield after calving was greater in the dry season than in the rainy season. The cause of the difference was probably nutritional rather than climatic.—R.M.

WEBER, A. F., WYAND, D. S. & PHILLIPS, M. G. (1957). **Studies of the incidence and morphology of accessory glandular tissue in the teat canal of the bovine mammary gland.**—*Amer. J. vet. Res.* **18,** 761-763. **2316**

Accessory glandular tissue (periductal lobules) was present in 2 teats from 11 cows. [See also *V.B.* **26,** 3949.]—R.M.

VAN VLIET, G., VAN DER HELM, G. & HUISMAN, T. H. J. (1957). Over het voorkomen van een afwijkend hemoglobine bij het schaap. [**Occurrence of an abnormal haemoglobin in sheep.**]—*Tijdschr. Diergeneesk.* **82,** 882-885. [English, French and German summaries. English summary modified.] **2317**

Two types of haemoglobin were found in Dutch sheep in an investigation covering 137 sheep; the "abnormal" type of haemoglobin was found in 47 animals (34%).

LARIN, N. M. (1958). **Effect of ultra-violet irradiation on electrophoretic properties of serum protein.**—*Nature, Lond.* **181,** 65. **2318**

The electrophoretic pattern of rabbit serum was completely changed by exposure to ultra-violet light for 2–12 hours. The changes indicated denaturation of the serum.—R.M.

CZERNICKI, B. (1957). Elektrophoretische Untersuchungen an Rinderserum. Ein Beitrag zu der Frage, ob Normalwerte für die Serumeiweissfraktionen des Rindes aufgestellt werden dürfen und ob es zu charakteristischen Abweichungen im Verlaufe der Gravidität kommt. [**Electrophoretic studies of bovine serum.**] — *Zbl. VetMed.* **4,** 588-602. [In English. German, French and Spanish summaries.] **2319**

Because of wide individual variations it was not possible to establish normal values for serum protein fractions in cattle. Changes in serum proteins characteristic of pregnancy in women were not found in the serum of pregnant cows.
—R.M.

GORDON, J. G. (1958). **The act of rumination.** —*J. agric. Sci.* **50,** 34-42. [Author's summary modified.] **2320**

A detailed analysis was made of the rumination behaviour of one caged sheep on four combinations of diet, ranging from 100% hay to 100% concentrate meal. When hay was fed there was no relationship between the quantity ingested and the amount of rumination, which averaged 8 hours daily. When concentrates were fed alone the daily rumination time fell to 2½ hours, and much of this was 'pseudo-rumination.' There was evidence that the number of chews and not the time chewing gave the accurate quantitative measurement of rumination. This sheep made an average of 39,000 rumination chews per day when hay was fed. The duration of the intervals between boluses was constant at 15% of total rumination time, but the rate of chewing varied from 83–99 chews per min., being slower from midnight to noon, when most rumination occurred. Rumination periods lasted from less than 1 min. up to about 2 hours. Tiring during a rumination period was reflected by an increase in the intervals between boluses but the number of chews per bolus remained unchanged. The first bolus of each period of rumination was chewed less than those following. This sheep averaged 15 periods of rumination per day, a daily total of 500 boluses being regurgitated. There were 2,500 chews per period and 78 chews per bolus.

QUARTERMAN, J., PHILLIPS, G. D. & LAMPKIN, G. H. (1957). **A difference in the physiology of the large intestine between European and indigenous cattle in the Tropics.** — *Nature, Lond.* **180,** 552-553. **2321**

The osmotic pressure and dry matter of contents of large intestine and faeces were greater

in zebu cattle than in European cattle. This may be related to the better ability of zebu cattle to thrive on dry, coarse pasture.—R.M.

DEITCH, A. D. & MOSES, M. J. (1957). **The Nissl substance of living and fixed spinal ganglion cells. II. An ultraviolet absorption study.** — *J. biophys. biochem. Cytol.* **3,** 449-456. [In *Stud. Rockefeller Inst. med. Res.* **155,** 163-169. (1958).] **2322**

Ultra-violet absorption studies on living neurones grown *in vitro* revealed the presence of discrete aggregates of cytoplasm containing a high concentration of nucleoprotein. These structures were identical with the Nissl bodies of the same cells seen after staining with basic dyes. Nissl granules were therefore not staining artefacts.—R.M.

GAMBLE, H. J. (1957). **Temperature effects in mammalian nerve regeneration.** — *Nature, Lond.* **180,** 146-147. **2323**

The ventral nerve in the tail of rats was crushed aseptically under ether anaesthesia. In animals subsequently kept at 2° to 2·5°C. all myelin sheaths as well as axons had degenerated after 22 days and up to 35 days no regenerating fibres could be found. In animals kept at 18° to 21°C., after 10 days myelin sheath degeneration was complete, as was axonal degeneration in the more distal part of the stump, but a large number of regenerating axons were present immediately distal to the crush. After 21 days fine, lightly myelinated fibres were present in the 1st and 2nd centimetres below the level of the crush and fine, unmyelinated axons extended at least 7 cm. below the crush. After 48 days, myelination was found as far as 6 cm. below the crush level.—E.V.L.

PAVLIK, L. G. (1958). **[Features of conditioned reflex activity in sheep.]** — *Sechenov J. Physiol.* **44,** 52-56. [In Russian. English summary.] **2324**

Conditioned responses to mechanical cutaneous stimulation were obtained fairly readily in sheep. By means of conditioned reflexes it was found that sheep could distinguish between light from a 115 watt lamp and that from a 120 watt lamp. The effect of castration on higher nervous activity differed from animal to animal.—R.M.

BRESSOU, C., POMRIASKINSKY-KOBOZIEFF, N. & KOBOZIEFF, N. (1957). Étude radiologique de l'ossiffication du squelette du pied du chien aux divers stade de son évolution, de la naissance à l'âge adulte. **[Radiological study of skeletal ossification in the foot of the dog from birth to adult age.]**—*Rec. Méd. vét.* **133,** 449-464. **2325**

Ossification in the hind foot was followed in 7 Alsatian dogs from birth to adult age. 20 radiographs are reproduced.—R.M.

ESTERGREEN, V. L., JR., SONI, B. K., BLOSSER, T. H. & ERB, R. E. (1957). **Diurnal variation and characterization of urinary neutral steroids and the effects of ACTH on these and other metabolites in dairy cattle.**—*Tech. Bull. Wash. agric. Exp. Sta.* No. 23. pp. 48. **2326**

Neutral steroids were determined by colorimetric methods applied to ether extracts of hydrolysed urine. Urine was collected once every 2 hours from 6 cows and 3 heifers. The diurnal variation consisted of maximum excretion between 6 p.m. and 2 a.m., (4 mg./hour) and minimum excretion between 2 a.m. and 10 a.m. (2·4 mg./hour). Chromatographic separation indicated that neutral steroids were composed of 5 different substances. By infra-red analysis of the steroids it was found that the majority were 3-ketosteroids. There were not many 17-ketosteroids and no 11-ketones; 11,17-ketones; 3,20-ketones or 20-ketones.

Excretion of neutral steroids did not vary greatly following ACTH administration, but isolated increases were observed; the method used for determination may have been defective. The action of ACTH on the chemical composition of the blood was similar to that observed in other species of animals.—R.M.

ROSENFELD, G., LEEPER, L. C. & UDENFRIEND, S. (1958). **Biosynthesis of norepinephrine and epinephrine by the isolated perfused calf adrenal.**—*Arch. Biochem.* **74,** 252-265. **2327**

Perfusion of the intact, isolated calf adrenal gland with a well-oxygenated artificial medium containing various precursors (*e.g.* 3,4-dihydroxyphenylethylamine) labelled with radioactive carbon permitted the recovery of large amounts of labelled norepinephrine and epinephrine. The pronounced differences in the turnover rate and hormonal biosynthetic activity of the bovine medullary and cortical tissues were discussed. —R.M.

SHELLABARGER, C. J. & PITT-RIVERS, R. (1958). **Presence of triiodothyronine in fowl.**—*Nature, Lond.* **181,** 546. **2328**

Cockerels aged 3 months were injected with 250 μc. radioactive iodine and were killed 24 hours later. Chromatography of butanol extracts of tryptic digest of the thyroid glands revealed the presence of a radioactive substance similar to triiodothyronine.—R.M.

GRAEGER, K. (1957). Zur Topographie der Bauchorgane des Schweines unter besonderer Berücksichtigung verschiedener Füllungszustände des Magens. **[Topography of the abdominal organs in the pig with special reference to variations in volume of the stomach.]** —*Zbl. Vetmed.* **4,** 1005-1016. [English, French and Spanish summaries.] **2329**

The position of the jejunum, ascending colon and spleen depend on the degree of fulness of the stomach. There are 6 diagrams of abdominal topography.—R.M.

WOOLLEY, D. W. (1957). **Probable evolutionary relationship of serotonin and indoleacetic acid, and some practical consequences therefrom.**—*Nature, Lond.* **180,** 630-633. **2330**

Although the natural growth hormone of plants (auxin) has long been known to be 3-indoleacetic acid, the hormone of similar chemical structure in the animal world, serotonin, has just recently come to light. W. discussed the implications of the possibility that serotonin is the counterpart in animals of auxin in plants.—R.M.

See also absts. **2088** (normal ruminal flora); **2089** (normal faecal flora); **2377** (book, blood and bone marrow patterns); **2378** (book, liver function and structure).

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

WELCH, H. (1957). **Antibiotics in food preservation. Public health and regulatory aspects.** —*Science* **126,** 1159-1161. **2331**

A review by the Director of the Division of Antibiotics of the U.S. Food and Drug Administration of the adulteration of human food by antibiotics. Whereas in poultry, antibiotics used for carcass preservation are destroyed on cooking, it has not been proved that they are destroyed in treated fish. Regulations state that milk from udders treated with antibiotics must be discarded during and for 72 hours after the end of treatment, and that mastitis preparations must not contain more than 100,000 units penicillin a dose. Antibiotic feed supplements and crop sprays did not constitute public health hazards.—R.M.

See also absts. **2023** (effect of pasteurization on E. monocytogenes); **2036** (contamination of egg products with salmonella); **2261** domestic animals and human disease); **2299** (lindane taint in eggs).

LIVESTOCK HYGIENE

BOROWSKI, W. (1957). **Characteristic humidity of farm buildings for lodging animals.**—*Bull. Acad. polon. Sci. Ser. Sci. biol.* **5,** 195-199. **2332**

The "characteristic humidity" was calculated by deducting the relative humidity outside the building from the relative humidity inside. The figure obtained was fairly constant for a given building housing a given number of animals and was a useful guide in the study of ventilation.—R.M.

WHATLEY, J. A., JR., PALMER, J. B., CHAMBERS, D. & STEPHENS, D. F. (1957). **The value of water sprinklers for cooling pregnant sows during the summer.**—*Misc. Publ. Okla. agric. Exp. Sta.* No. MP-48. pp. 2-4. **2333**

Forty-one pregnant gilts and yearling sows were placed on 4 lucerne pasture plots, each provided with an open shade, the ground beneath the shade being covered with 6–8 inches of sand. Under 2 shades a water sprinkler was installed, which sprinkled water from 8 a.m. to 5 p.m. daily for 2 months (mid-June to mid-August). The maximum daily air temp. during the trial was, on the average, 96·3°F. When the air temp. was between 96° and 108°F., the average rectal temp. in sprinkled sows was 101°F. and in controls 103·8°F. In sprinkled sows the average number of live piglets per litter was 10·06 with 0·82 stillborn piglets and 0·06 decomposed embryos. The corresponding figures for controls were 7·71, 1·53 and 0·65. —M.G.G.

REPRODUCTION AND REPRODUCTIVE DISORDERS

VANDEPLASSCHE, M. (1957). **Artificial insemination of cattle with special reference to fertility and disease control.** In "Advances in veterinary science" Vol. III. pp. 397-461. [New York (& London): Academic Press Inc.] **2334**

Vandeplassche has abstracted much of the relevant literature and gives an account of the past economic importance of vibriosis and trichomoniasis in artificial insemination and assessment of the present position and prospects. Antibiotic treatment of semen is inadequate alone as a control measure. [The statement that *C. pyogenes* is a very pathogenic organism for the bovine requires some qualification.] In many countries it must be assumed that proved bulls for livestock improvement must have

become venereally infected at a stage in their life when they are indispensable for the A.I. programme. Importance of treatment is therefore emphasized and Vandeplassche stresses that preputial irrigation treatments alone are not uniformly effective against vibriosis. 90% of individuals cured is the best result to date against trichomoniasis.

Motility and density tests are regarded as the most practical ones for semen quality although their limitations are realized. The use of "teaser" bulls in place of teaser cows is advocated.—F. L. M. DAWSON.

BARKER, C. A. V. (1958). **The collection of semen from bulls, rams and bucks by electro-ejaculator.** — *Canad. J. comp. Med.* **22**, 3-8. **2335**

The electro-ejaculator employed was designed on models already in use. The procedure for collection of semen from bulls, rams and bucks is described. The semen collected was thinner, possibly because the seminal fluid was allowed to remain in the collection tube and dilute the sample; as a rule it froze satisfactorily. Failure to collect semen from suspected infertile bulls was not common. No after-effects were observed. The apparatus was useful in detecting inability to protrude the penis. Three bulls regained their ability to mate. It is considered that while the electro-ejaculator has its uses the artificial vagina should be used whenever possible.—T.E.G.R.

HILL, J. R., JR., HURST, V. & GODLEY, W. C. (1958). **A comparison of reconstituted skim milk and egg yolk-sodium citrate as extenders for ram semen.**—*Amer. J. vet. Res.* **19**, 132-134. [Authors' summary modified.] **2336**

Reconstituted skim milk compared favourably with egg yolk–citrate as a diluent in trials with semen from 4 yearling rams. The samples after dilution were stored at 38°F. for periods up to 15 days.

HAHN, J. (1957). Die Bedeutung von Glykokoll als Verdünnerzusatz für Bullensperma. **[Glycine as an additive to bull semen.]**—*Zuchthyg. FortpflStörung. u. Besamung.* **1**, 349-351. **2337**

50 ejaculates from 5 bulls were used. 3 and 4·5% glycine plus egg yolk proved much less effective than egg yolk–citrate as a buffer in prolonging viability, but the addition of 0·5% glycine to 2·5% egg yolk–citrate appeared somewhat to improve *in vitro* viability, though early results indicate that conception rate is unaffected.—F. L. M. DAWSON.

DÖCKE, F. & WEICHERT, W. (1957). Untersuchung zur Testung von Bullenejakulaten hinsichtlich ihrer Eignung zur Tiefkühlung (−79°C). **[Examination of bull semen for storage at −79°C.]**—*Zuchthyg. FortpflStörung. u. Besamung.* **1**, 340-346. **2338**

92 ejaculates from 9 bulls were examined in respect of the proportion of motile spermatozoa in the fresh state, after 10 min. at 0°C., after glycerol equilibration, after 10 min. in dry ice, and on finally thawing out. The dry ice test appeared to give a high correlation with freezing results, which should be of considerable practical use in selection both of bulls and ejaculates. The quick-freezing method appeared in all respects superior to slow cooling to −20°.

—F. L. M. DAWSON.

YUSHCHENKO, N. P. (1957). **[Demonstration of the possibility of storing mammalian spermatozoa in the dried state.]**—*Proc. Lenin. Acad. agric. Sci.* **22**, No. 6. pp. 37-40. [In Russian.] **2339**

Bull spermatozoa were frozen in a mixture of Freon and heptane at −20° to −78°C., vacuum-dried, and stored in sealed ampoules for 20 months at room temp. Microscopic observation showed that 15%—20% revived. Ram and rabbit spermatozoa were freeze-dried and stored for 8 months. Female rabbits bore young after insemination with rabbit spermatozoa that had been freeze-dried and stored at 18° to 20°C. for 30—40 days.—M.G.G.

CAMPBELL, R. C. & JAFFE, W. P. (1958). **The motility of mixed semen.**—*J. agric. Sci.* **50**, 64-65. [Authors' summary.] **2340**

An attempt was made to verify a report that mixed samples of bull semen show better motility and survival than their unmixed controls. The claim was not confirmed; in 83 of 104 samples the motility score of the mixed sample was less than the score for the better individual constituent sample.

WOHLFARTH, E. (1957). Vaselineschäden bei Besamungsbullen. **[Preputial lesions caused by vaseline in bulls used for artificial insemination.]** — *Zuchthyg. FortpflStörung. u. Besamung.* **1**, 362-365. **2341**

The development of granular and vesicular lesions at the preputial orifice with some general thickening, associated with recovery of *Ps. pyocyanea*, was attributed to the use of yellow vaseline as a lubricant. Bulls recovered in 5–7 weeks when this lubricant was replaced by milk. [The case incidence was not stated.]

—F. L. M. DAWSON.

LUNDVALL, R. L. & CAMPBELL, R. L. (1957). **Chlorpromazine hydrochloride for the exami-**

nation of the penis in bulls.—*J. Amer. vet. med. Ass.* **131,** 86-87. **2342**

Chlorpromazine hydrochloride was inj. i/v in 2 bulls at 0·2 and 0·4 mg./kg. body wt. respectively. Within 5–10 min. the bulls were relaxed enough for the penis to be withdrawn from the sheath for examination.—R.M.

BONADONNA, T., SFERCO, A. & ZULIANI, T. (1957). **Some observations on the rectal, scrotal, sub-scrotal and endo-testicular temperatures in the bull.**—*Zbl. VetMed.* **4,** 697-710. [In English. German and Italian summaries.] **2343**

Temperature measurements were made, by Hartman-Braun electric thermometer, on four bulls 15–16 months old; rectally, at the scrotal surface, between layers of the tunica vaginalis, and within the testicular substance. On a fifth bull, trials were made before and after 5 min. immersion of the scrotum in water at 5°C.; this caused a drop of up to 6·4°C. in intra-testicular temperature. In general previous results were confirmed. The mean difference between rectal and subscrotal temperatures was 5·3°C.; endo-testicular temperatures were one degree higher than subscrotal.—F. L. M. DAWSON.

VOLOSKOV, P. A. (1957). Les infections contagieuses des organes génitaux des bovins et les moyens de lutte. **[Contagious diseases of the genital system in cattle in Russia.]**—*Bull. Off. int. Epiz.* **48,** 168-176. [English summary.] **2344**

Brucellosis eradication began systematically in 1925 and by 1957 large tracts of the U.S.S.R. were free; the author claimed that this result was facilitated by the collective farm system. Trichomoniasis was first diagnosed in 1935 in imported Hereford, Swiss and Simmenthal cattle. A *Trichomonas foetus* research programme got properly under way in 1944. The author believed that the seminal vesicles usually became involved in the bull. He alleged that the organism was rather anaerobic. Diagnosis is routinely made by culture from mucus samples, preputial washings and vesicular secretions using a skim milk medium with added penicillin and streptomycin. Bulls are treated parenterally with arsenicals and both sexes locally with iodine preparations. Results are claimed to be good. Vibriosis was not diagnosed until 1950. The mucus agglutination test is found satifactory for diagnosis in the female. However, it is claimed that a blood complement-fixation reaction developed in Leningrad was more satisfactory, and applicable to both sexes. [No details supplied.] It is claimed that by 1940 a technique had been developed for killing semen trichomonads by addition of iodides 1:10,000 strength, but antibiotics have superseded this in vibriosis control.

—F. L. M. DAWSON.

HOLCOMBE, R. & HOLCOMBE, R. B. (1957). Några Lakttagelser på sexualorgan från finska nötkreatur. **[Observations on sex organs from Finnish Landrace cattle.]** — *Finsk. VetTidskr.* **63,** 566-574. [In Swedish. English summary.] **2345**

Sex organs from 808 Finnish Landrace cows and heifers were examined at 2 abattoirs. Ovarian hypoplasia was fairly common (25% of animals were affected), so was cystic ovarian degneration (13·8%). A form of persistent hymen was observed in 12% sexually immature heifers, but not in older cattle. Hypoplasia of the left testicle was seen in 38·5% of 167 Landrace bulls.—R.M.

MCLEAN, J. W. (1957). **Vaginal prolapse in ewes—part III: The effect of topography on incidence.**—*N. Z. vet. J.* **5,** 93-97. [Author's summary modified.] **2346**

Field survey data showed an average incidence of vaginal prolapse before lambing of 0·346% in Romney breeding ewes of all ages in Southland, New Zealand. This estimate was based on 105 farms carrying 112,886 ewes, approximately half of which were on downs country. The incidence on farms on flat land was low, being 0·165%. On other than flat country, of a comparable nature, the incidence was significantly higher, averaging 0·503%, and it is only on this type of country that the disease is likely to assume economic importance. The difference between the two classes of country is so striking as to lead to the conclusion that the sloping nature of downs country plays an important part in the aetiology of the disease. It was suggested that the higher incidence was due to the increased intra-abdominal pressure known to develop on a level with the pelvic inlet when ewes in advanced pregnancy lie down on slopes with their hindquarters lower than their forequarters. Further work to test this hypothesis is in progress.

WHITTEN, M. K. (1957). **Effect of exteroceptive factors on the oestrous cycle of mice.** — *Nature, Lond.* **180,** 1436-1437. **2347**

Female mice caged together in groups exhibit inhibition of the oestrous cycle, with ovarian quiescence, associated with mucification of the vaginal epithelium. Introduction of a male confined within a grid results in the rapid reappearance of oestrus. It is assumed that an olfac-

tory stimulus reacts on the female pituitary, since removal of the olfactory bulbs in the female also produces anoestrus, which however, is not exhibited by individually caged females.

—F. L. M. Dawson.

Herbert, J. & Zuckerman, S. (1957). **Effect of cerebral lesions upon oestrus in ferrets.**—*Nature, Lond.* **180,** 547-548. **2348**

The authors refuted a suggestion that the anterior hypothalamus of ferrets contained a centre which inhibited the production of follicle-stimulating hormone during the anoestrum. The basis for this belief was based on observations that bilateral lesions made during the winter in this part of the hypothalmus resulted in the precocious appearance of oestrus. It was much more probable that the surgical interference constituted a form of non-specific stress of the kind which leads to precocious puberty in rats.

—R.M.

Clewe, T. H. & Mastroianni, L. (1958). **Mechanisms of ovum pickup. I. Functional capacity of rabbit oviducts ligated near the fimbria.**—*Fertil. & Steril.* **9,** 13-17. **2349**

Ligation experiments revealed that suction caused by peristalsis in the oviduct was not essential to ensure entry of the ovum; entry into the oviduct was assisted by the fimbria.—R.M.

Whitten, W. K. (1957). **Culture of tubal ova.**—*Nature, Lond.* **179,** 1081-1082. **2350**

Growth of mouse ova to the blastula stage *in vitro* was more rapid in the presence of lactate (calcium or sodium salt) that in the presence of pyruvate or malate. Growth did not occur in the presence of acetate, propionate, citrate, glycerol or glycine. The significance of lactate in this respect was discussed.—R.M.

Black, D. L. & Asdell, S. A. (1958). **Transport through the rabbit oviduct.** — *Amer. J. Physiol.* **192,** 63-68. **2351**

Oil and Indian ink were spread both up and down the oviduct by segmentary and pendular movements of the smooth muscle of the oviduct, but they were arrested at a point 2–3 cm. anterior to the junction with the uterus unless more than 0·1 ml. was used. Ligation of the infundibular end of the oviduct caused distension. Therefore oviduct secretions must normally pass through the infundibulum and not into the uterus. This probably aided the transport of spermatozoa while ova were prevented from escaping in the same direction by cilia and mucosal folds.—R.M.

Aron, C., Asch, L. & Gandar, R. (1957). Données nouvelles sur le déterminisme du nombre des corps jaunes. III. Interprétation, sur des bases expérimentales, du phénomène de la superovulation. **[Factors determining the number of corpora lutea. III. The phenomenon of superovulation.]**—*C. R. Soc. Biol., Paris* **151,** 166-169. **2352**

Fresh extract of bovine anterior pituitary gland was administered s/c to sexually immature rats in either one dose of 500 mg. (24 rats), or three doses of 150 mg. at intervals of 12 hours (29 rats). The single dose resulted in the formation of an average of 6·7 ovulatory corpora lutea in 79% of the rats, while the divided dose resulted in the formation of 13·1 bodies in 65% of the rats. It was concluded that the second and third of the 3 injections luteinized follicles which were not ready for luteinization at the time of the previous injection; superovulation depended not on the amount of ovarian stimulant but on the duration of its action.—R.M.

Day, F. T. (1957). **The veterinary clinician's approach to breeding problems in mares.** — *Vet. Rec.* **69,** No. 49. Pt. 2. pp. 1258-1264. Discussion: pp. 1264-1267. **2353**

Probably about 10% of diagnosed 40-day pregnancies terminate in early foetal death, the conceptus being found on the vaginal floor at the ensuing heat. Up to 300 mg. progesterone implanted appears to control this disorder. Anovulatory oestrus is common, responding well to luteinizing hormone (LH), of which the dose required may rise to 5,000 i.u. Manual rupture of the follicles can also be effective. Small multiple ovarian cysts tend to accompany pyometra and sometimes respond to stilboestrol implants. Large cysts are thought to require unilateral surgical removal; ability to breed may then persist on the other side. A benign venereal vaginitis is described. In discussion on the paper the effectiveness of LH treatment was challenged and it was emphasized that the seat of nymphomaniac behaviour might often be elsewhere than in the ovary. The frequency with which vaginal windsucking occurred was confirmed.

—F. L. M. Dawson.

Huber, W. G. (1957). **A breeding-rest fertility program.**—*Vet. Med.* **52,** 585-587. **2354**

37 cows in 4 herds received a uterine irrigation at from 20–45 days post-partum with 100 mg. freeze-dried calcium glucose–terramycin complex. The treated groups in each herd showed improved breeding capacity, treated animals requiring a mean of 1·46 services per pregnancy and controls 2·18. [The basis of selec-

tion as between controls and treated cases is not detailed, and total numbers involved are small.]—F. L. M. DAWSON.

MCKAY, G. W. & THOMSON, J. D. (1958). **Field observations on the use of two treatments for "repeat breeder" cows.**—*Canad. J. comp. Med.* **22**, 21-23. **2355**

Of 312 cows treated with an organic iodine compound 201 conceived after the first service; of 215 cows treated by expressing the corpus luteum 95 conceived after the first service.

—T.E.G.R.

MORGANTINI, F. (1957). Di una singolare alterazione dell'endometrio osservata nel cane. [**An abnormal condition of the endometrium in a bitch.**]—*Acta med. vet., Napoli* **3**, 263-276. [French and German summaries.] **2356**

The macro- and microscopic appearance of cystic glandular dysplasia in the endometrium of a bitch is described. The condition was associated with a large tumour of the endometrium itself and a pre-existing fibroma of the chorion is tentatively suggested as the origin of the lesion. The hypothesis of internal endometriosis, based on the macroscopic characters of the lesion, is not supported by the histological findings.—T.E.G.R.

SMITH, J. C. & NALBANDOV, A. V. (1958). **The role of hormones in the relaxation of the uterine portion of the cervix in swine.**—*Amer. J. vet. Res.* **19**, 15-18. [Authors' summary modified.] **2357**

The uterine cervix in pigs consisted of a long vaginal portion which constricted and relaxed cyclically, and a short uterine portion which remained tightly closed. The vaginal portion was constricted during the first two days of oestrus and then relaxed gradually until about the ninth day of the oestrous cycle with gradual constriction beginning again about the 14th day. After oophorectomy there was complete relaxation of the vaginal portion, while the uterine portion was not noticeably affected. Injection of oestrogen into castrated sows caused cervical constriction which continued as long as oestrogen was injected. Oestrogen injected into normal sows in mid-cycle somewhat hastened cervical constriction. Even large doses of progesterone (20 mg. daily) did not relax the cervix either in sows in oestrus or in castrated sows in which cervical constriction was caused by the injection of 1 mg. of oestrogen daily. Relaxin injected at the rate of 750 guinea-pig units per day did not relax the cervix. Experiments with relaxin are being continued.

I. BO, W. J. (1957). **The origin and development of estrogen-induced uterine metaplasia.**—*Arch. Path.* **64**, 595-600. **2358**

II. BO, W. J. (1957). **Histochemical observations on metaplastic epithelium of the rat uterus.**—*Ibid.* 601-606. **2359**

I. Experiments on rats indicated that oestrogen-induced uterine metaplasia begins as numerous independent foci located along the uterine horns. These foci eventually coalesce and replace the original lumen epithelium with a stratified squamous epithelium. The abnormal growth apears to be a direct effect of oestrogen stimulation and not a secondary reparative process.

The cells that give rise to the metaplastic epithelium of the uterus following oestrogen stimulation were observed to be the basal cells of the lumen epithelium.

II. In the metaplastic epithelium small numbers of glycogen granules were present in the epithelial cells. A considerable amount of cytoplasmic basophilic material was observed in the basal and intermediate cells of the metaplastic epithelium, while the superficial cells contained fine granules which were not too numerous. Deposits of cobalt sulphide, indicating the presence of alkaline phosphatase, were observed only in the intermediate and superficial layers of the stratified metaplastic epithelium.

CLARINGBOLD, P. J. & LAMOND, D. R. (1957). **Optimum conditions for the biological assay of gonadotrophins.**—*J. Endocrin.* **16**, 86-97. [Authors' summary modified.] **2360**

The assay of gonadotrophic preparations by means of the uterine weight of the immature mouse was studied using a preparation of chorionic gonadotrophin. An optimum biological assay is obtained if the following conditions are fulfilled: (i) The total dose is administered 44 hours before killing; (ii) Mice of similar body wt. and age are used immediately after weaning; (iii) Responses are corrected by co-variance for variation in body wt. Significant secular variation in both position and slope of the dose-response line occurs. It is stressed that adoption of factorial methods of experimentation considerably facilitates the development of a biological assay technique.

MASON, R. W., BONE, J. F., BOGART, R. & KRUEGER, H. (1958). **Urogenital anomalies in calf born to beef cow treated with testosterone during pregnancy.**—*J. Pharmacol.* **122**, 49A-50A. **2361**

Two Hereford cows were injected with 1 mg./kg. body wt. testosterone once weekly

from the 5th to 31st weeks of pregnancy. One cow gave birth to a normal male calf. The other gave birth to a hermaphrodite which was killed for examination at 8 months of age: it was predominantly female, having 2 ovaries, fallopian tubes, uterine horns and a vagina. The urethra terminated in a rudimentary penis.—R.M.

TURMAN, E. J., HUMPHREY, R. D., CHAMBERS, D. & STEPHENS, D. (1957). **Radiographs of the lumbar vertebrae of beef calves and their association with the snorter dwarf gene.**—*Misc. Publ. Okla. agric. Exp. Sta.* No. MP-48. pp. 33-42. **2362**

The lumbar vertebrae of normal calves are rectangular in outline, and have a smooth ventral surface which is arched dorsally. In dwarf calves the ventral surface is undulating and protrudes downwards. In addition it is usually shortened, giving the vertebrae a triangular, rather than a rectangular outline. The lumbar vertebrae of apparently normal calves which carry the dwarf gene are of intermediate appearance, varying from slightly to highly abnormal.

Of 37 dwarf calves 35 were classified as dwarf purely on the basis of radiographs of the lumbar vertebrae and 2 were classified as extremely abnormal. Of 11 calves known to be carrying the dwarf gene 9 were classified as abnormal and 2 as free from the dwarf gene. Sixteen bulls, 7 classified as "clean" and 9 as carriers, were each test-mated with carrier cows. Two of the 9 that were predicted carriers sired dwarf calves while no dwarfs were sired by the 7 predicted "clean". In a trial of "clean" and carrier cows, which were mated with both "clean" and carrier bulls, carrier cows produced more calves classified as abnormal than "clean" cows. No dwarfs were produced by "clean" cows. It is concluded that the results of this method are sufficiently promising to justify further research.—M.G.G.

FREUDENBERG, F. (1957). Die Bedeutung der Intersexualität beim Schwein als erbliche Geschlechtsorganmissbildung. **[Hermaphroditism in pigs and other hereditary malformations of the genital organs.]**—*Mh. VetMed.* **12,** 608-613. **2363**

Hermaphroditism in a pig was described. This condition was less common than allied disorders of the same causation: cryptorchidism, testicular hypoplasia, and impotence from malformation of the penis. Two examples of the inheritance of these conditions were given.

—R.M.

AMOROSO, E. C., LOOSMORE, R. M., RIMINGTON, C. & TOOTH, B. E. (1957). **Congenital porphyria in bovines: first living cases in Britain.**—*Nature, Lond.* **180,** 230-231. **2364**

Congenital porphyria, characterized clinically by pink discoloration of the teeth and by skin lesions of photosensitization, was diagnosed in three Shorthorn heifers in one herd. Excretion of porphyrins in urine and faeces was studied, and the genetic basis of the condition was described.—R.M.

See also absts. **2029** (infertility in male goats); **2054** (leptospiral abortion in sows); **2064-2066** (genital vibriosis); **2149** (ovine virus abortion); **2372** (C.S.I.R.O. reports, Australia).

ZOOTECHNY

PAYNE, W. J. A. & HANCOCK, J. (1957). **The direct effect of tropical climate on the performance of European-type cattle. II. Production.** — *Emp. J. exp. Agric.* **25,** 321-338. **2365**

Eight sets of Jersey, Shorthorn or Jersey × Shorthorn identical twin heifer calves were divided between Fiji and New Zealand. Feeding and management in the two countries were identical and the only major difference to which the animals were subjected was that of climate. Growth and milk production were studied from the age 7½ months to the end of their first lactation. Milk production and food intake were, in general, lower in the tropical climate of Fiji than in New Zealand; water intake was considerably higher in Fiji. There was no correlation between the average daily rectal temp. or respiration rate and daily milk production in the tropical climate.

—R.M.

MICHELS, H. (1957). Beschouwingen over thermoregulatie adaptatie en produktie van het rundvee in de tropen. **[Thermoregulation, adaptation and production of cattle in the Tropics.]**—*Thesis, Utrecht* pp. 222. [English, French and German summaries.] **2366**

A discussion of the literature on the physiological effects of a hot climate and the breeding of cattle suitable for tropical countries.—R.M.

MCQUEEN, R. G. (1957). **Hormones and leather quality.**—*Vet. Rec.* **69,** 1096. **2367**

The author described a defect in cow hides which resulted in disintegration of an area of the corium around the tail head after tanning and splitting. Because the defect occurred only in cow hides, some undefined action of female sex hormones was suggested as the cause, but there was no positive evidence on this point.—R.M.

POWELL, E. O. (1958). **Criteria for the growth of contaminants and mutants in continuous culture.** — *J. gen. Microbiol.* **18**, 259-268. [Author's summary.] **2368**

Criteria are given for the establishment of growth of contaminants and mutants in continuous cultures of the Monod [*V.B.* **22**, 2986] type. These explain, in particular, why contaminants so rarely interfere with the operation of such cultures.

TECHNIQUE AND APPARATUS

MORTON, H. E. (1957). **Stainless-steel closures for replacement of cotton plugs in culture tubes.**—*Science* **126**, 1248. **2369**

Cylinders of stainless steel 4 cm. long, closed at one end and open at the other, were made in a size which fitted over the open ends of 16-mm. culture tubes. Small indentations in the cap of the cylinder ensured a small air space between tube and cap. This method of closing culture tubes had several advantages over cottonwool plugs. Loss of media by evaporation was nearly half that occurring in tubes plugged with cottonwool.—R.M.

JAMESON, J. E. & EMBERLEY, N. W. (1958). **Teepol in substitution for bile salts.**—*J. gen. Microbiol.* **18**, 238. [Authors' summary.] **2370**

When any grade of Teepol, other than Teepol 530, Teepol L or Teepol (without suffix), is used in culture media, the authors recommend that it should first be tested for suitability.

GORHAM, J. R. (1957). **A simple technique for the inoculation of the chorioallantoic membrane of chicken embryos.**—*Amer. J. vet. Res.* **18**, 691-692. **2371**

A technique is described which permits, in a single injection, a combination inoculation of the chorioallantoic membrane, allantoic chamber and yolk chamber. After 8 days' incubation an opening large enough to admit a needle is made in the blunt end of the egg; with the egg held upright a 1¼ to 1½ inch, 21 to 24 gauge needle on a tuberculin syringe is inserted through the hole to a depth of about ¼ in. and 0·2 ml. of inoculum released into the air sac. The needle is then passed down the egg to a depth of 1 in. and removed. After incubation, the embryo can be removed by gentle shaking through a hole made in the pointed end of the egg; the chorioallantoic membrane will remain adherent to the inside of the shell and can be collected separately.—E.V.L.

See also absts. **2006** (radiographic detection of pulmonary TB. in monkeys); **2059** (media for leptospires); **2063** (cultivation of anaerobic spore-forming bacteria); **2064** (diagnosis of V. fetus infection); **2073** (rapid differentiation of atypical acid-fast colonies from Nocardia); **2075** (growing bacteria in concentrated culture); **2092** (cultivation of trypanosomes); **2152** (cultivation of swine fever virus in tissue culture); **2156-2158** (cultivation of Teschen disease virus in tissue culture); **2223-2224** (tissue culture of avian lymphomatosis virus).

REPORTS

AUSTRALIA. (1956). **Eighth annual report of the Commonwealth Scientific and Industrial Research Organization for the year 1955-56.** pp. 179. Canberra: A. J. Arthur, Commonwealth Govt. Printer. 10s. 6d. **2372**

An experimental herd remained free from *Str. agalactiae* mastitis for a further year following elimination of the organism by treatment with penicillin, closing of the herd and maintenance of good shed hygiene. After exposure to natural infection with BRUCELLOSIS no evidence of infection was found in 17 cows which had been vaccinated as calves seven years previously nor in 19 vaccinated as calves seven years previously and again three years later. Of 22 controls 11 aborted and 16 were found infected at parturition. BRUCELLOSIS IN SHEEP—Complement-fixation titres are not great enough to indicate the course or extent of the disease. Agglutination tests have not been promising. Selective culture media for heavily contaminated material have given encouraging results. A diphtheroid organism was isolated from cases of FLEECE ROT. In the presence of moisture it produced dermatitis experimentally. *Pseudomonas aeruginosa* produced a green colour in the fleece but not dermatitis. The organisms in combination produced dermatitis and discoloration. Of the common dipping agents (insecticides) dieldrin (0·01%) was the most effective inhibitor of the diphtheroid.

The causal organism of MYCOTIC DERMATITIS, *Nocardia* (*Dermatophilus*) *dermatonomus*, was inhibited by 0·1% diazinon and its growth greatly reduced by 0·01%. It was also inhibited by 0·001% arsenious oxide, and by some of the constituents of wool fat, *e.g.* capric, myristic and lauric acids. Undecylenic acid was also inhibitory. An ether extract of the fleece of a sheep resistant to artificial infestation inhibited growth of the organism at 0·25%.

Chloramphenicol ("Chloromycetin") injected i/v failed to cure 8 of 12 cases of FOOT ROT; given by mouth it yielded inconclusive results. After treatment with formalin apparently cured cases may relapse after a few weeks.

A colloidal sulphur application was not highly effective. *Fusiformis nodosus* was sensitive to terramycin but not to polymyxin B sulphate. Trials with terramycin were promising but its instability in alcohol is a disadvantage. Urea extraction of prekeratin from the sheep's hoof and subsequent digestion yields a product which supports the growth of *F. nodosus*.

The sensitivity of three strains of *Fusiformis necrophorus* was tested against chloramphenicol, terramycin, aureomycin, penicillin, streptomycin, polymyxin B sulphate, and sulphadimidine. Chloramphenicol was most active, followed by terramycin and penicillin. In field trials chloramphenicol, penicillin and sulphadimidine were disappointing except in early cases.

Chloramphenicol has given promising results in treatment of the untoward effects of intracaudal vaccination against BOVINE CONTAGIOUS PLEUROPNEUMONIA.

During an outbreak of EPHEMERAL FEVER numerous insects (chiefly Ceratopogonidae and mosquitoes) were collected. Extracts from them injected into susceptible cattle failed to produce the disease.

Temperature, humidity and diameter of wool fibre or hairs influence oviposition by lice. Shedding of the coat in horses has a more severe effect on the population of *Damalinia equi* than on *Haematopinus asini* because the eggs of the latter can be laid on the coarse hairs of the mane which are not shed, whereas *D. equi* can lay only on the finer hairs of the coat which are shed. Preventing mice from grooming themselves allowed *Polyplax serrata* to extend its habitat from the head to the rest of the body.

Malathion "jetted" into the fleece at 0·25% proved ineffective against adult blowflies and protected against larval implants only 4–6 weeks. Dieldrin was effective for 18 weeks. Diazinon at 0·1% protected for 19 weeks and in another trial 0·01% was effective for 20 weeks. There was no correlation between length of fleece (1, 1·75 and 2·5 inches) and duration of protection against FLY STRIKE when either dieldrin or diazinon was "jetted" into the fleece. Protection by dieldrin broke down at 9 weeks; diazinon persisted for 17–19 weeks. Systemic administration of dieldrin or aldrin was ineffective for treatment of struck sheep because the larvae were not affected for 7–8 days after treatment. Aldrin and dieldrin injected in peanut oil at 100 mg./kg. prevented development of larvae in implants for 18 weeks but this dose rate approaches the toxic levels. Lower doses were ineffective, as were those of BHC even at 100 mg./kg.

Ecological studies on sheep blowfly included design of a "knockdown" trap to minimize damage to the flies; substitute baits; and refinements in marking flies with fluorescent dyes. Studies have begun on the nature of the "S" factor which affects oviposition by the flies. More eggs were laid in cavities between staples in open-fleeced sheep than in dense wooled fleeces.

The effects of insecticides on *Psorergates ovis* were studied in patch tests. Malathion (0·02%) and diazinon (0·05 and 0·01%) appeared promising but the delta isomer of BHC (0·02%) was not effective.

The toxin of *Ixodes holocyclus* is produced by larvae, nymphs and adults. The carbohydrate metabolism of the muscle of paralysed mice showed disturbances in glycolysis, localized between the glucose-1-phosphate and 3-phosphorglyceric acid levels. Engorged female *I. holocyclus* produce a pink cuticular excretion which on injection will paralyse mice. A new species of *Ixodes*, closely resembling *I. holocyclus* has been found on opossums. It does not paralyse mice.

Zebu (*Bos indicus*) Shorthorn cross cattle were more resistant to infestation by *Boophilus microplus* than pure Shorthorns. Resistance was due to development of skin hypersensitivity. Many larvae were removed by licking and many were killed by exudate at the site of attachment. Some *B. taurus* showed as strong resistance as *B. indicus*.

B. microplus in Queensland shows resistance to arsenic, chlorinated compounds (BHC, dieldrin, aldrin, toxaphene, chlordane) and lately, in restricted areas, to DDT. Ticks resistant to DDT proved susceptible to BHC, toxaphene and dieldrin, and to diazinon. The addition of the synergist DME to DDT brought about a high mortality in ticks resistant to DDT. Ticks resistant to toxaphene were susceptible to DDT. Strains resistant to DDT were controlled by spraying with 0·05% diazinon or Bayer "L13/59" (an organic phosphorus insecticide). Other insecticides tested included endrin, "L13/59", chlorthion and "Tedion V18". Wool wax kills ticks when applied to the spiracles and was very effective when applied to infested cattle. Systems of resting pastures have proved very promising for the control of cattle tick.

Copper pentachlorphenate was highly effective as a molluscicide against *Simlimnaea subaquatalis*, but repopulation occurred within three months. The intermediate host of the paramphistome, *Calicophoron calicophorum*, is a planorbid snail, *Pygmanisus perlorius*.

Studies on the exsheathment of nematode larvae show that substances in the rumen appear

to "trigger" the action. Bile and serum have a similar action. Ligation experiments show that a moulting factor is released from the vicinity of, but anterior to, the base of the oesophagus of the larvae. Changes in rumen pH also play a part. Work on helminth parasites included the physiology and pathology of infestations with *Nippostrongylus muris*. Studies on *Haemonchus placei* in cattle showed that an infestation superimposed on an existing one will not develop to maturity, but may survive as fourth stage larvae in the abomasum. These immature worms may account in part for the slow recovery of animals which, according to their egg counts, have rid themselves of infestation. When cattle were maintained on a diet of lucerne or a mixture of 12 parts oat chaff and 1 part lucerne chaff, experimentally administered infestations failed to persist. Heaviest infestations were seen in cattle dosed with 1000 larvae daily and treated with phenothiazine monthly. When examined post-mortem nine weeks after a challenge dose, numerous mature and immature worms were present. Egg counts are not useful in diagnosis in animals which have developed resistance and in which large numbers of immature worms may persist. There was no relationship between the copper status of cattle and worm burdens. Calves affected with HAEMONCHOSIS showed no changes in serum calcium, phosphorus or protein, but there were decreases in haemoglobin and red cells. *H. placei* larvae were deeply embedded in the ducts and tubules of the gastric glands 36 to 76 hours after infestation. Moulting to the adult stage occurred 11 to 14 days after infestation. When the young adults began to feed there was general inflammation and ulceration in circumscribed areas of the mucosa. In concurrent infestations with *H. placei* and *H. contortus* (from sheep) the latter developed more rapidly. Infective larvae of strongylid nematodes of cattle migrated at least 36 inches from the dung pat under moist conditions. Dry weather inhibited migration. Temperatures of 45°C. killed *H. placei* larvae. Some larvae which reached the infective stage at the end of winter were alive 3 months later. There was no relationship between the fat content of infective larvae (after storage for 15 days in water) and infectivity. Infective larvae less than 24 hours old were not highly infective. An improved technique has been developed for recovery of larvae from pasture samples. *H. placei* females produce about 1000 eggs per 24 hours compared to 5000 to 10,000 for *H. contortus*. Studies with anthelmintics in cattle showed that phenothiazine at 0·2 g./lb. body wt. was highly effective against *H. placei* 8 and 42 days old but had little effect on young adult worms 14 days old. Piperazine hydrate was ineffective against *H. placei, Bunostomum phlebotomum, Trichostrongylus axei,* and *Cooperia* spp., but highly effective against *Oesophagostomum radiatum*. There were indications that it may be effective against *Ostertagia* spp. Piperazine-1-carbodithioic betaine, even after a dose of sodium bicarbonate to close the oesophageal groove, was not effective against *H. placei, B. phlebotomum, T. axei* or *Cooperia* spp. Neither of the piperazine compounds was effective against *Moniezia,* nor was mepacrine (atebrin). Papain (0·5 g. per lb. body wt.) was not effective against *H. placei* and *Cooperia* spp. Lindane (3 mg./lb. body wt.) was ineffective against *B. phlebotomum*. Young sheep were susceptible to challenge doses of *T. colubriformis* larvae until they were about 9 months old. Selective control of *Chabertia ovina* by monthly treatment with 1 : 8-dihydroxyanthraquinone resulted in increased wool growth and decreased incidence of tenderness or "break" in the fibre. A comparison of the ecology of nematode larvae on natural and sown pastures showed that generally the number of larvae per unit area recovered from the sown pasture was greater than that from natural pasture, but mean worm egg counts from sheep grazing the sown pasture (4 per acre) were lower than those of sheep grazing natural pastures (1 per acre). The only striking differences in the microclimate in the two types of pasture were in maximum temperatures. Suppression of *H. contortus* by repeated drenching with carbon tetrachloride did not generally appear to influence the incidence of concurrent infestations with *Trichostrongylus* spp. under field conditions. Pregnancy did not affect acquired resistance to *T. colubriformis* in ewes. An initial infestation with *T. colubriformis* in lambs younger than 5–6 months heightened the resistance to a challenge dose in only a small proportion of animals. An initial infestation with this species at 5–6 months heightened resistance to a challenge dose given 8 weeks later. When challenged at 3 weeks there was little evidence of resistance, while challenge at 5 weeks resulted in an additive infestation. Initial infestations of 2000 or 5000 *T. colubriformis* larvae were not as effective as 15,000 larvae in stimulating resistance. Intermittent intake of *T. colubriformis* larvae was not as effective as continuous infestation with adult worms. There was no evidence of cross-resistance between *T. colubriformis* and *T. axei*. In a field trial the effects of additional doses of larvae to lambs exposed to natural infestation were not consistent but appeared to stimulate develop-

ment of resistance. In sheep resistant to *H contorus*, infective larvae exsheathed normally in the rumen. Studies on anthelmintics for sheep showed that although doses of 3 g. phenothiazine every second day, 5 g. twice weekly or 10 g. weekly reduced worm egg counts, cultures continued to yield a few *Trichostrongylus* spp. larvae. Sheep provided with a phenothiazine–salt mixture (1 : 15) ingested 0·6 g. phenothiazine daily over 16 weeks but *H. contortus* infestations were not suppressed. 2-chloro-7-methoxyphenothiazine which was very effective against oxyurids in mice, did not show similar effects in sheep. The addition of riboflavin, ascorbic acid or nicotinamide did not affect anthelmintic efficiency of phenothiazine. A number of chlorinated derivatives of phenothiazine were tested but none was as effective as phenothiazine. Piperazine-1-carbodithioic betaine was not very effective against *Trichostrongylus* spp. in sheep. Piperazine adipate was effective against *Oes. columbianum* but not against *H. contortus* or *Trichostrongylus* spp. A number of piperazine derivatives were not effective. 1 : 8-dihydroxyanthraquinone was very effective against *Ch. ovina* in a field trial. Hexachlorethane was ineffective against *Trichostrongylus* spp. but there appeared to be slight additive effects when it was combined with phenothiazine. Lead arsenate had variable effects against *H. contortus* when injected into the rumen. 2-mercaptobenzthiazole and 6-nitromercaptobenzthiazole were ineffective against *F. hepatica*. Phenothiazine was a useful indicator in studies on the oesophageal groove reflex in sheep. It appears in the urine within 30 min. when swallowed into the abomasum but not for 120 min. when swallowed into the rumen. Electrical stimulation of the pharyngeal mucosa did not stimulate the oesophageal groove reflex. *Strongyloides papillosus* infestations occurred in sheep in earth pens under wet conditions. Spraying the soil with a phenolic compound ("Kerol"), or copper sulphate or copper pentachlorphenate failed to effect control. Treatment of the sheep with phenothiazine, gentian violet, hexachlorethane or piperazine was ineffective. The stearate of the asymmetric complex tris-ethylenediamine Co III was very effective against oxyurids in mice. The racemate as well as the separate *d*- and *l*- forms were equally effective. The symmetric hexamine Co III complex was ineffective.

As little as 0·05 mg. cobalt administered twice daily prevented PHALARIS STAGGERS. Application of cobalt to pastures gives relatively transient protection unless large quantities are used. It may be possible to prevent the disease by application of cobalt to pastures in the autumn when fresh growth of phalaris often begins. However, it appears that the use of cobalt pills (now termed "bullets") will be effective and also simpler and cheaper.

In studies on HAEMATURIA VESICALIS in cattle the excretion of abnormal products of tryptophane metabolism, and their possible action as bladder irritants and carcinogens, are being investigated.

The incidence of SHEATH ROT (BALANITIS) in sheep is being surveyed in relation to soil and pasture and a critical evaluation is being made of surgical and other means for treatment and prevention.

Work on the toxic factor in the non-dialysable fraction of the rumen fluid of wheat-gorged sheep showed that it withstood autoclaving and that its effect on sheep was not inhibited by previous treatment with the antihistamine "Anthisan"; it was without effect on the isolated g.pig ileum but caused the perfused spleen of the sheep to contract. Sheep could be rendered tolerant to it by injections of sublethal amounts at short intervals, but as this state of tolerance had no effect upon the illness after wheat gorging, no support was gained for the suggestion that absorption of this material from the bowel might play a part in the condition.

Studies on chronic COPPER POISONING (one of the entities in the TOXAEMIC JAUNDICE complex) showed that molybdenum in the diet was an important factor in limiting copper retention, but only when the diet also contained adequate amounts of inorganic sulphate. It appears that excretion of free sulphate through the kidneys is an essential factor in the complex interaction of these elements and compounds. High protein diets which, like high inorganic sulphate intake, raise the excretion of free sulphate in the urine, will limit copper retention when the diet contains molybdenum. Studies on HELIOTROPE POISONING (a second entity of the TOXAEMIC JAUNDICE complex) showed that the pathological changes seen in the liver of sheep could be reproduced in rats by administration of the alkaloids isolated from *Heliotropium europaeum*.

Experiments extending over 15 months showed that drinking water containing 2% NaCl was toxic for sheep eating dry feed and although 1·5% NaCl was slightly toxic there was some evidence of developing tolerance. Water containing 1% was safe. The elctrolytes in plasma were increased only in the sheep drinking 2% NaCl and in them the chloride concentration was increased. Further trials suggest that 0·5% magnesium chloride is a toxic concentration.

Deterioration of the teeth of sheep drinking

water containing 20 p.p.m. of fluornie had an adverse effect on body wt. and wool production especially in dry seasons, and the death rate was higher in such sheep. There was no adverse effect on reproduction even in the fifth year of the trial.

A hard porous cylinder of cobalt oxide and china clay made by baking at high temperatures is sufficiently dense to remain in the rumen or reticulum of sheep, gradually releasing cobalt at a rate adequate to supply the needs of the animal for the formation of vitamin B_{12}, for the control of COBALT DEFICIENCY disease and of PHALARIS STAGGERS.

In studies on COPPER DEFICIENCY sheep were grazed on grossly deficient pastures and when symptoms of copper deficiency appeared some were given supplements of copper, molybdenum, or sulphate. Those given Cu supplements showed increases in blood Cu. Those given Mo as well as Cu showed greater increases. Mo supplements caused increased blood Cu levels, but sulphate supplements had no effect. The wool of all the sheep that received Cu supplements improved, although the deficiency lesion remained apparent in the fleeces of those that received Mo in addition. Unsupplemented sheep continued to grow "steely" wool, the character of which deteriorated further in those given Mo. Sulphate had no effect on the character of the fleece. ENZOOTIC ATAXIA was apparent at birth in all lambs born to Cu-deficient ewes, except those treated with Mo. Demyelination was delayed in these lambs but developed subsequently.

Other problems of veterinary interest include studies on MYXOMATOSIS, clover oestrogens, nutritional work on carbohydrates and stereochemistry, vitamin B_{12} and cobalt metabolism, COPPER DEFICIENCY, microbial processes of rumination, diabetic sheep and lambs, utilization of the lower fatty acids, acetylation in sheep and lambs, urea and nitrogenous compounds as a source of nitrogen for ruminants, drought feeding; studies on INFERTILITY and physiology of reproduction including the effects of reversed seasonal lighting, high temperature and pregnancy in ewes, physiology of foetal and neonatal lambs, lactation, husbandry and lamb mortality; biological studies on skin and wool growth including the effects of hormones; genetic work with sheep and cattle including the effects of environment on the coat changes of cattle and their sweat glands.—H. McL. GORDON.

UGANDA PROTECTORATE. (1956). **Annual Report of the Department of Veterinary Services and Animal Industry for the year ended 31st December, 1955.** [RANDALL, J. B.] pp. 53. Entebbe: Govt. Printer. Shs. 3/-. **2373**

The health of livestock was on the whole good; no major epizootic occurred. Uganda now carries about 3,094,000 cattle and 3,607,000 sheep and goats. Short-horned zebu cattle comprise about 70% of the cattle population. The consumption of livestock during 1955 was about 320,000 cattle and 1,110,000 sheep and goats.

Minor outbreaks of ANTHRAX, BLACKLEG, HAEMORRHAGIC SEPTICAEMIA and FOWL TYPHOID occurred in many districts and were controlled by vaccination. TUBERCULOSIS is present in Ankole Longhorn cattle but the nomadic habits of the owners of these cattle makes elimination difficult or impossible.

TRYPANOSOMIASIS control involved the treatment of 80,000 cattle with antrycide dimethyl sulphate. Over 8,000 cattle are now being kept in areas of light tsetse fly infestation under the protection of antrycide "prosalt." No resistant strains of trypanosomes have been encountered.

FOOT AND MOUTH DISEASE continued to be prevalent in the eastern stock-producing areas and in Buganda, causing, however, only minor disturbance to stock trade, yet no less than 431 outbreaks were confirmed. An exacerbation of RABIES occurred in the Bukadi country and the West Nile district, both scheduled as proclaimed districts under the rabies ordinance. About 71,000 cattle were immunized against RINDERPEST.

The Veterinary Training School is associated with the Animal Health Centre at old Entebbe and is responsible for the training of the Department's veterinary assistants.

During the year the Animal Health Research Centre at Entebbe was re-organized into six centres: Disease Research including bacteriology, helminthology, virus diseases and diagnostic services; Environmental Physiology; Animal Genetics; Nutritional Chemistry; Pasture Agronomy; and Entomology.

The report includes 20 excellent photographs.—D. S. RABAGLIATI.

NETHERLANDS. (1958). Gezondheidsdienst voor postduiven. **[Health service for carrier pigeons. Annual report for 1956/57.]** [VAN VLOTEN, J. G. C.]—*Tijdschr. Diergeneesk.* **83, 311-315.** **2374**

Evidence of *Trichomonas hepatica* infection was seen in 1,508 of 3,644 live pigeons examined; there were 121 clinical cases of trichomoniasis affecting the mouth, throat, oesophagus or umbilical region. 371 of 1,244 blood samples from pigeons with clinical signs of paratyphoid were

positive to agglutination tests for *S. typhimurium*. Complement-fixation tests for psittacosis were performed on 1,453 blood samples: 690 were positive. A rattling noise in the throat and moist eyes were characteristic signs of psittacosis in pigeons. 113 pigeons were severely infested with *Ascaridia columbae*. Eggs of *Capillaria columbae* were present in faeces from 182 birds. The commonest mite found was *Cnemidocoptes laevis*, but *Syringophilus bipectinatus* and *Falculifer rostratus* also occurred on plumage. The fungus *Torulopsis famata* was isolated from a skin disease of the head and feet of a pigeon.—R.M.

BOOK REVIEWS

SNELL, W. H. & DICK, E. A. (1957). **A glossary of mycology.** pp. xxxi + 171. Cambridge, Massachusetts: Harvard University Press. (London: Oxford University Press.) 40s. **2375**

In the veterinary field this glossary offers many mycological definitions not easily obtained in concise form. Particularly useful are the entries on antibiotics, and simple explanations of many of the terms used in the taxonomy, morphology and genetics of fungi may be found. Those mycoses mentioned almost exclusively refer to human infections so that the descriptions may not strictly apply to animals. One might question the definition of that misleading name "blastomycetes" as "ascus-forming yeasts" rather than "budding fungi" in the broad sense and perhaps wonder whether "mycetoma" is adequately defined. Mycologists will find this glossary a most useful addition to their libraries. It is largely complementary to the well-known "Dictionary of the Fungi" by Ainsworth and Bisby and there is little overlap between the two.—P. K. C. AUSTWICK.

RICHARDSON, U. F. & KENDALL, S. B. (1957). **Veterinary protozoology.** pp. xii + 260. Edinburgh (& London): Oliver & Boyd. 2nd Edit. Revised. 22s. 6d. **2376**

In the preparation of this second edition, S. B. Kendall has joined up with Richardson and the book has been re-written. There has been a serious dearth of text-books on veterinary protozoology and certain of those which have been published have failed to provide the necessary cover of the subject. The late Banner Bill Morgan's book was very good in many respects, but an outsider perusing it would infer that there was no tropical aspect of the protozoan diseases of animals.

Richardson and Kendall have provided just what was required and this book should find a place in the library of every individual and institution concerned with any aspect of veterinary protozoology. It gives a systematic, clear account of the micro-organisms concerned, the manner in which they are related to disease and the field and other aspects of the subject. Control measures are clearly set out. There is a good chapter on chemotherapy, an essential part of a book on protozoology.

This book is very concise. To be selective great discrimination is required and the authors can be congratulated on the extent to which they have covered the subject with what must be regarded as the minimum of words. Tropical veterinary medicine has been mentioned, so it is well to say that the non-tropical diseases have been equally well dealt with, notably coccidiosis.

When writing a concise book and an extensive literature has to be covered an author is faced with the dilemma of striking a balance between his duty to the reader and to literary accuracy. An example in this book is the statement that Bennett (1933) gave a good description of surra in camels. An author writing on this point fifty years ago would have been faced with an equally difficult choice of an author to quote; there were so many from which to choose. Bennett was a useful choice, but in naming him some injustice was done to others.

A milestone in tropical veterinary work which might have been mentioned in this book was Hornby's successful exploitation of the action of tartar emetic on bovine trypanosomiasis. It has been stated, though it may be known only to a few, that it was the regimen of treatment upon which Hornby kept working bullocks in a fly belt for the transport of the essential materials which made possible the establishment of the copper mining industry in Rhodesia.

The illustrations are adequate and clear. There is a good index. The quality of the paper, the printing and the binding are of the standard to be expected from the publishers. A point on which British publications score heavily in competition with those of some countries is the remarkably low price. It is possible that some potential buyers from overseas may not realize that the quality is not necessarily related to the price and that, even to-day literary bargains are obtainable.—W.A.P.

TALBOTT, G. D., HUNSICKER, E. R. & LI, J. (1957). **Blood and bone marrow patterns.** pp. 59. New York (& London): Grune & Stratton. $12.00. **2377**

This is an atlas of photomicrographs in colour of the human blood cell patterns as seen in peripheral blood and aspiration biopsies of bone marrow. The first part deals with the identification of the individual cells but the major emphasis is on the blood cell patterns as seen in the leucaemias, lymphomas and other abnormal conditions affecting the blood.

The text consists entirely of legends to the plates and these are very clear and well related to the points in the plates which are being described.

The price (12 dollars) is high but this is probably inevitable in a book containing so many colour plates.

POPPER, H. & SCHAFFNER, F. (1957). **Liver: structure and function.** pp. xv+777. New York (Toronto & London): McGraw-Hill Book Company Inc. 155s. **2378**

This is a splendid book. There will always be differences of opinion and rival theories among experts: for example, not all pathologists will agree with the authors' analysis and classification of cirrhosis. But leaving aside such disputes, the authors have written a brilliant account of their subject. This is no history book: one will not find in it evaluation of the work of the early pioneers. On the other hand one will find included work published as recently as 1956, so that the book is remarkably up to date.

The first quarter is devoted to the structure and function of the normal liver. Subsequent sections deal with pathologic phenomena in the hepatobiliary system, clinical study of hepatic function and structure (a discussion of metabolic, radiological and histological studies on the living subject), diffuse diseases (including viral and metabolic diseases), and focal diseases (bacterial and parasitic lesions and tumours). There is a further section entitled Internal and external environment and the liver, which discusses the relationship between the liver and other organs and its response to physical stress. The eighth section is a useful appendix in which the authors comment on the co-ordination of biochemical and histological studies in diagnosing hepatic disease. A bibliography lists 3,735 references up to 1954. An additional section presents précis of subsequent work relevant to each chapter, published in 1955 and 1956. The illustrations are excellent and the printing of high quality.

—L. M. MARKSON.

BRANDLY, C. A. & JUNGHERR, E. L. [Edited by.] (1957). **Advances in veterinary science. Vol. III.** pp. xi+579. New York (& London): Academic Press Inc. $13.00. **2379**

This volume contains the following:—Anesthesiology by L. W. Hall; Diseases of the central nervous system of domesticated animals and comparisons with human neuropathology, by J. R. M. Innes and L. Z. Saunders; The eradication of bovine brucellosis in Scandinavia, by A. Thomsen; Brucellosis in sheep and goats, by G. Renoux; Swine brucellosis by H. S. Cameron; Helminthic diseases by H. McL. Gordon; Antinematodal drugs by L. M. Jones; Artificial insemination of cattle with special reference to fertility and disease control, by M. Vandeplassche; Clostridial diseases of animals, by L. D. Smith. Each of these articles will be reviewed separately in the *Veterinary Bulletin*.

—R.M.

BOOKS RECEIVED

[Notice of recently received books in this list does not preclude review.]

BARGER, E. H., CARD, L. R. & POMEROY, B. S. (1958). **Diseases and parasites of poultry.** pp. 408. London: Henry Kimpton. 37s. 6d.

CHIODI, V. (1957). Storia della veterinaria. **[History of veterinary science.]** pp. 535. Milan: Farmitalia Servizio Veterinario. [In Italian.]

GRAY, A. P. (1958). **Bird hybrids. A check-list with bibliography.** pp. x+390. Farnham Royal: Commonwealth Agricultural Bureaux. 50s. [Technical Communication No. 13 of the Commonwealth Bureau of Animal Breeding and Genetics, Edinburgh.]

MAHADEVAN, P. (1958). **Dairy cattle breeding in the tropics.** pp. xiii+88. Farnham Royal: Commonwealth Agricultural Bureaux. 15s. [Technical Communication No. 11 of the Commonwealth Bureau of Animal Breeding and Genetics, Edinburgh.]

SMYTHE, R. H. (1958). **Veterinary ophthalmology.** pp. viii+379. London: Baillière, Tindall & Cox. 2nd Edit. 42s.

ANON. (1958). **New and nonofficial drugs. Containing descriptions of therapeutic, prophylactic and diagnostic agents evaluated by the Council on Drugs (formerly Council on Pharmacy and Chemistry) of the American Medical Association.** pp. xxx+645. Philadelphia (& Montreal): J. B. Lippincott Company. London: Pitman Medical Publishing Co. Ltd. 30s.

Printed in Great Britain by CHARLES BURRELL & SON, Chertsey Surrey.

CONTENTS

	Page
Diseases Caused by Bacteria and Fungi	419
Diseases Caused by Protozoan Parasites	431
Diseases Caused by Viruses and Rickettsia	433
Immunity	442
Parasites in Relation to Disease [Arthropods]	444
Parasites in Relation to Disease [Helminths]	445
Spontaneous and Transmissible Neoplasms and Leucaemias [Including Fowl Paralysis]	448
Nutritional and Metabolic Disorders	449
Diseases, General	458
Poisons and Poisoning	462
Pharmacology and General Therapeutics	463
Physiology, Anatomy and Biochemistry	464
Public Health, Veterinary Services and Veterinary Education	468
Reproduction and Reproductive Disorders	469
Zootechny	474
Technique and Apparatus	475
Reports	476
Book Reviews	477
Books Received	479

INDEX TO AUTHORS

Adams, C. E., 2670.
Adler, H. C., 2436.
Adler, J. H., 2607.
Ajello, L., 2443.
Aksel, I. S., 2468.
Akulov, A. V., 2398.
Alexander, S., 2382.
Alicata, J. E., 2546.
Aliev, A. G., 2425.
Allen, C., 2633.
Alston, J. M., p.479.
Altevogt, R., 2394.
Altschul, R., 2638.
Anaya, J. S., 2402.
Anczykowski, F., 2422.
Anderson, G. W., 2656, 2657.
Andrewes, C. H., 2494.
Andriese, P. C., 2698.
Armstrong, D. G., 2555.
Audran, R., 2517.
Austwick, P. K. C., 2445.
Averill, R. L. W., 2666.
Aykan, T. B., 2468.

Babień, Z., 2622.
Badawy, A. M., 2693.
Bagratuni, L., 2382.
Bąk, T., 2622.
Baker, E. W., 2531.
Baker, L. A., 2552.
Bandemer, S. L., 2557.
Bangham, A. D., 2645.
Barber, R. S., 2565.
Barger, E. H., 2711.
Barnett, A. J. G., 2569.
Barnicoat, C. R., 2570, 2635.
Barron, D. H., 2671.
Le Bars, H., 2601, 2602.
Bassett, E. G., 2672.
Bastarrachea, F., 2393.
Bates, F. W., 2615.
Beinhauer, W., 2386.
Bélanger, L. F., 2618.
Bell, F. R., 2563.
Bellamy, R. E., 2474, 2475.
Benedict, A. A., 2505.
Benson, R. E., 2594.
Bernstein, A., 2409.
Berthrong, M., 2396.
Beutler, E., 2584.
Biely, J., 2689.
Bieri, J. G., 2600.
Bishop, M., p. 479.
Björk, G., 2688.
Blaker, R. G., 2395.
Blamberg, D. L., 2588.
Blaxter, K. L., 2555, 2583.
Bletner, J. K., 2679.
Blunt, M. H., 2685.
Bobrov, P. F., 2485.
Börnig, H., 2627.
Boggs, D., 2590.
Bohl, E. H., 2426.
Bojalil, L. F., 2393.
Bond, V. P., 2616.
Booker, D. V., 2655.
Boucher, J. H., 2659.
Boulanger, P., 2477, 2478.
Bowlby, G. M. S., 2696.
Boyd, R. J., 2501.
Bratton, R. W., 2662.
Braude, R., 2565.
Briggs, G. M., 2600.
Brill, J., 2412.
Broom, J. C., p. 479.
Brotherston, J. G., 2479.
Brown, F., 2464.
Brown, L. B., 2524.
Brown, T. H., 2540.
Brueckner, A. L., 2465.
Brumby, P. J., 2695.
Brunson, J., 2401.
Bud-Husaim, P., 2658.
Burke, W. T., 2553.

Calet, C., 2631.
Camp, L. B., 2444.
Campbell, R. M., 2693.
Cantrell, W., 2456.
Card, L. E., 2711.
Carpenter, C. M., 2420.
Carter, P. D., 2623.
Cauthen, G. E., 2542.
Chapronière, D. M., 2494.
Chatterjee, D. P., 2387.
Chernuisheva, M. I., 2417.
Chin, P. H., 2616.
Chow, B., 2603.
Christensen, N. O., 2593.
Ciak, J., 2408.
Citron, K. M., 2397.
Clark, C. H., 2610.
Clark, G. M., 2461.
Clarkson, M. J., 2457.
Clifton, C. E., p.479.
Coles, R., 2556.
Collery, L., 2641.
Comar, C. L., 2618, 2677.
Combs, G. F., 2588.
Coombs, R. R. A., 2514.
Couch, J. R., 2587, 2599, 2613.
Creech, B. G., 2599.
Cresswell, E., 2700.
Crick, J., 2464.
Crookshank, H. R., 2561.
Cross, B. A., 2639, 2673.
Cruickshank, J. G., 2564.
Cuckler, A. C. *et. al.*, 2455.
Cucullu, N. L., 2467.
Cuthbertson, D. P., 2693.
Cutkomp, L. K., 2526.

Dannacher, G., 2462.
Darby, N. B., 2698.
Datt, N. S., 2470.
Davidson, J. A., 2557.
Davies, R. E., 2587.
Davis, D. C., 2544.
Davis, D. E., 2506.
Dawson, R. M. C., 2664.
Delaplane, J. P., 2506.
Depelchin, A., 2643.
Deshpande, P. D., 2575, 2576.
Dhake, P. R., 2450.
Dhanda, M. R., 2498.
Diesem, C. D., 2679.
Dishington, I. W., 2581.
Dixon, A. D., 2636.
Dixon, F. J., 2521.
Dobrowolska, D., 2554.
Dodd, D. C., 2596.
Dodson, L. F., 2642.
Domański, E, 2554.
Donati, E. J., 2614.
Douvres, F. W., 2539.
Dowben, R. M., 2594.
Draper, H. H., 2574.
van Drimmelen, G. C., 2415.
Dudorova, E. P., 2485.
Dugal, L. P., 2604.
Dunlop, A. A., 2446.
Dunn, H. O., 2662.
Dupont, M., 2558.
Dye, J. A., 2607.
van Dyke, H. B., 2519.
Dyrendahl, S., 2688.

Eade, N. R., 2652.
Eckman, P., 2401.
Economou-Mavrou, C., 2589.
Edgar, S. A., 2544.
Elvehjem, C. A., 2575, 2576.
Ender, F., 2581.
Engelund, A., 2593.
Epps, N. A., 2656.
Erne, K., 2626.
Evans, E. T., Rees, 2384.
Evans, R. J., 2557.
Evans, T. M., 2531.
Everett, N. B., 2573.
Everson, G. J., 2586.

Fain, A., 2530.
Fast, J., 2441.
Fedida, M., 2462.
Fedoroff, S., 2638.
Feldman, G. L., 2613.
Fell, B. F., 2693.
Ferguson, T. M., 2613.
Fink, K., 2598.
Fink, R. M., 2598.
Fischer, M., 2403.
Fisk, G., 2590.
Flachat, C., 2462.
Flood, J. C., 2662.
Fontaine, J., 2462.
Foote, L. E., 2458.
Foote, R. H., 2659, 2662.
Frazier, J. A., 2544.
Frunder, H., 2627.
Fujimoto, Y., 2490.

Gale, C., 2612.
Gantt, W. H., 2603.
Garren, H. W., 2410, 2411.
Gentiles, M. A., 2457.
Gentry, R. F., 2624.
Georg, L. K., 2444.
Gerson, T., 2570.
Giardinello, F. E., 2562.
Gillespie, R. J. G., 2559.
Glick, B., 2568.
Glasser, M. E., 2633.
Goldwasser, R. A., 2518.
Gołębiowski, S., 2412, 2438.
Gomberg, H. J., 2543.
Gordon, H., McL., 2538.
Gould, D. J., 2531.
Gould, S. E., 2543.
Gracey, J. F., 2582.
Grafe, A., 2510, 2511.
Graham, N. McC., 2555.
Grahn, D., 2637.
Granett, P., 2525.
Graves, F. T., 2551.
Gray, J., 2661.
Greenman, V., 2616.
Greenwood, A. W., 2687.
Gregg, N. C., 2509.
Gregory, T. S., 2447.
Gresham, G. A., 2564.
Groth, W., 2649.
Groupé, V., 2504.
Groves, T. W., 2541.
Gruenstein, M., 2553.
Grummer, R. H., 2579.
Grunert, E., 2419.
Gryczowa, B., 2422.
György, H., 2497.

Habel, K., 2469, 2509.
Hahn, F. E., 2408.
Hamilton, M. A., 2396.
Hammond, P. B., 2619.
Hansard, S. L., 2458.
Hansen, M. F., 2545.
Hansens, E. J., 2525.
Hanson, R. P., 2501, 2508.
Hansson, C.-H., 2632.
Haralambiev, H., 2389.
Harper, A. E., 2575, 2576.
Harrington, G., 2694, 2713.
Harris, C., 2553.
Harrison, H. C., 2577.
Harrison, H. E., 2577.
Harry, E. G., 2567.
Hartley, W. J., 2459, 2596.
Harvey, A. L., 2526.
Haussmann, H. G., 2510, 2511.
Havlík, O., 2429.
Hayman, R. H., 2446.
Heilman, D. H., 2420.
Helgebostad, A., 2581.
Hellegers, A., 2671.
Helwig, D. M., 2431.
Helwig, R., 2453.
Henry, S. S., 2519.
Hill, C. H., 2410, 2411.
Hirato, K., 2491.
Hiroe, K., 2681.
Hochfeldt, I., 2407.
Hoekstra, W. G., 2579.
Holz, J., 2460.
Hornibrook, J. W., 2509.
Howard, B., 2634.
Howard, D. H., 2420.
Huck, R. A., 2480.
Huckabee, W. E., 2671.
Hull, W. B., 2531.
Hunt, W. G., 2454.
Hurley, L. S., 2586.
Hutcheson, M. K., 2583.
Hutt, F. B., p. 479.

Ianev, E., 2389.
Innes, J. R. M., 2614.
Inukai, T., 2536.

Jaartsveld, F. H. J., 2414.
Jacotot, H., 2492, 2493.
James, W. D., 2629.
Jensen, C. E., 2668, 2669.
Jensen, K. E., 2471.
Jensen, L. S., 2566.
Jettmar, H. M., 2472.
Johns, A. T., 2560.
Johnson, I. S., 2552.
Johnston, A. M., 2529.
Justo, L. F. A., 2467.

Kaplan, W., 2444.
Kauffmann, G., 2629.
Keating, J., 2641.
Keefe, E. R., 2633.
Keegan, H. L., 2531.
Keller, J. C., 2522.
Kent, S. P., 2594.
Kerékjártó, B. V., 2466.
Kersting, G., 2466, 2488.
Kiggins, E. M., 2435, 2437.
Kilchsperger, G., 2416.
King, J. T., 2597.
King, W., 2401.
Kirk, R. W., 2659.
Kleckner, A. L., 2608.
Knecht, A. T., 2434.
Knox, R., 2701.
Kloc, J., 2432.
Korngold, L., 2515.
Krishna Rao, C., 2665.
Krishna Roa, N. S., 2385.
Krzywy, T., 2441.
Kulczycki, J., 2609.
Kulkarni, H. V., 2548.
Kulkarni, V. B., 2450.
Kunin, C. M., 2481.
Kuntz, R. E., 2533.
Kurung, J. M., 2392.
Kyle, M. G., 2685.

Ladell, W. S. S., 2617.
Lang, W. R., 2692.
Larski, Z., 2487.
Leblond, C. P., 2573.
Lee, C. P., 2597.
Lee Chin Hua, 2549.
Van Leeuwen, G., 2515.
Lehmann, H., 2645.
Lemaire, R., 2558.
Levi, R. S., 2395.
Levine, S., 2499.
Lewis, P. K., Jr., 2579.
Lichton, I. J., 2571.
Lindsey, D., 2434.
Lococo, S., 2426.
Lodenkämper, H., 2403.
Losee, F. L., 2578.
Lotz, W. E., 2618, 2677.
Lucam, F., 2462.
Lucas, C. C., 2559.
Lübke, A., 2463.
de Lüchter, N. R. L., 2467.
Lumsden, W. H. R., 2527.
Lurie, M. B., 2395.
Lutyński, R., 2413.
Lyon, W., 2578.

McCance, R. A., 2589, 2591, 2592.
MacDonald, A. M., 2583.
McDonald, M. W., 2572.
McDonald, N. R., 2424.
Macfarlane, W. V., 2634.
McGinnis, J., 2566.
Mackaness, G. B., 2642.
McLean, F. C., 2648.
McLimans, W. F., 2562.
MacOwen, K. D. S., 2703.
Madin, S. H., 2698.
Mahler, H. R., 2653.
Málek, P., 2432.
Manjrekar, S. L., 2450.
Mann, T. R. R., 2686.
March, B. E., 2689.
Marek, K., 2495.
Marshall, S. C., 2459.
Maynard, L. A., 2590.
Meschia, G., 2671.
Messerli, W., 2390.
Metcalf, J., 2671.
Meyn, A., 2388.
Mialhe, P., 2646.
Mihajlovic, S., 2486.
Millot, P., 2520.
Minuse, E., 2481.
Mitchell, K. G., 2565.
Mizuno, N. S., 2615.

Mohiyuddeen, S., 2385.
Molle, J., 2601, 2602.
Moller, K., 2381, 2684.
Moore, R. O., 2454.
Mori, H., 2536.
Morris, R. J. H., 2634.
Mosier, H. D., 2585.
La Motte, L. C., Jr., 2473.
Mukherji, A., 2387.
Munch, T., 2593.
Murat, P., 2422.

Nasr, S., 2380.
Nassal, J., 2391.
Netter, A., 2708.
Nicander, L., 2674.
Nickel, H., 2403.
Nilakantan, P. R., 2498.
Nishikawa, Y., 2681.
Newsam, I. D. B., 2682.

Obiger, G., 2383.
O'Brien, E., 2505.
Ogneanov, D., 2389.
O'Grady, F., 2442.
Okuneva, V. V., 2485.
Olsson, S. E., 2688.
Orfila, J., 2451.
Orlans, E. S., 2470.
Ortega, P., 2625.
Osamura, K., 2491.
Oshio, Y., 2537.

Palmer, A. C., 2483.
Parfitt, J. W., 2532.
Parlett, R. C., 2399.
Parnas, J., 2418.
Pate, D. P., 2608.
Patrick, H., 2580.
Paturi, S., 2498.
Paul, W. M., 2611.
Penikett, E. J. K., 2701.
Pérez-Tamayo, R., 2393.
Perman, V., 2615.
Persaud, B. R. B., 2545.
Peterson, W. D,. Jr., 2471.
Pette, J., 2488.
del Pino, M., 2467.
Plastridge, W. N., 2435, 2437.
Podliachouk, L., 2520.
Pokorný, J., 2429.
Pollard, C. J., 2600.
Pollard, E., 2502.
Pomeroy, B. S., 2711.
Poulik, M. D., 2651.
Prescott, B., 2629.
Prevot, A. R., 2433.
Price, E. K., 2699.
Priestley, F. W., 2448.
Prokhorov, A. V., 2398.
Provost, A., 2449.
Prystowsky, H., 2671.

Quevedo, W. C., Jr., 2637.
Quiroz, C. A., 2508.
Raghavachari, K., 2513.
Rahman, M. M., 2599.
Rake, G. W., 2562.
Rangneker, P. V., 2604.
Raynaud, M., 2433.
Reagan, R. L., 2465.
Reber, E. F., 2606.
Record, B. R., 2697.
Reddy, A. M. K., 2513.
Reed, W. C., 2633.
Van Reen, R., 2578.
Reeves, W. C., 2474, 2475.
Reid, B. L., 2587, 2599.
Reid, R. L., 2569.
Reid, W. M., 2608.
van Rensburg, S. W. J., p. 480.
Rerat, A., 2601, 2602.
Reynolds, I. M., 2423.
Reynolds, S. R. M., 2611.
Richter, C. P., 2585.
Richter, G., 2627.
Richter, K., 2683.
Rigdon, R. H., 2613.
Roepke, M. H., 2619.
Rohde, B., 2466.
Rook, J. A. F., 2565.
Rosenberger, G., 2419.
Rowell, J. G., 2565.
Rowson, L. E. A., 2666.
Rudge, J. M., 2424, 2430.

Sabathier, J., 2558.
Sacquet, E., 2406.
Säring, H., 2405.
Salisbury, G. W., 2663.
Salisbury, R. M., 2620, 2621.
Santamarina, E., 2650.
Sautter, J. H., 2615.
van der Schaaf, A., 2414.
Schäfer, W., 2476, 2500.
Schaible, P. J., 2557.
Schliesser, T., 2388.
Schlumberger, H. G., 2550.
Schrinner, E., 2388.
Schultze, M. O., 2615.
Schyns, P., 2507.
Scrivani, R. P., 2474, 2475.
Seguin, D., 2590.
Seibert, F. B., 2400.
Seibold, H. R., 2678.
Shanahan, G. J., 2523.
Sharman, G. A. M., 2583.
Shay, H., 2553.
Shepard, C. C., 2518.
Shimizu, K., 2491.
Shope, R. E., 2484.
Shorland, F. B., 2570.
Sillioc, R., 2433.
Silverberg, R. J., 2509.
Silverman, M. S., 2616.
Silvestrini, D. A., 2657.
Simmons, B., 2573.
Simonson, M., 2603.
Simpson, R. W., 2504.
Sims, F. H., 2561.
Slinger, S. J., 2656.
Smith, C. N., 2522.
Smith, H. R., 2426.
Smith, R. E., 2423.
Smithies, O., 2651.
Smyth, J. D., 2535.
Smythe, R. H., 2710.
Snell, J. F., 2630.
Snyder, E. S., 2656, 2657.
Soběslavský, O., 2512.
Soekawa, M., 2491.
Sørensen, P. H., 2605.
Soulsby, E. J. L., 2547.
Spedding, C. R. W., 2540.
Speirs, R. S., 2516.
Springer, G. F., p. 480.
Stade, K., 2627.
Stamp, J. T., 2482.
Stanecki, J., 2441.
Staples, E. L. J., 2620, 2621.
Stehlik, Z., 2404.
Stelzner, H. D., 2613.
Stewart, D. F., 2440.
Stone, B. F., 2528.
Stower, J., 2658.
Stratton, J., 2699.
Strohmaier, K., 2489.
Stula, E. F., 2435.
Sturkie, P. D., 2644.
Sugie, T., 2681.
Supplee, W. C., 2588.
Suter, P., 2595.
Sutton, M., 2620.
Sykes, J. F., 2676.
Sypowiez, D. A., 2630.
Szaflarski, J., 2487.
Szurman, J., 2487.

Takemoto, K. K., 2509.
Tandon, R. S., 2534.
Taylor, E. L., 2532.
Taylor, R., 2697.
Teige, J., 2690.
Terp, P., 2593.
Textor, K., 2644.
Thanassi, F. Z., 2630.
Thompson, M. E., 2529.
Thompson, R. E. M., 2442.
Tiefenbacher, H., 2496.
van Tienhoven, A., 2680.
Titchen, D. A., 2647.
Todd, J. R., 2582.
Toshkov, A., 2452.
Tromba, F. G., 2539.
Truszczyński, M., 2439.
Turpin, A., 2433.
Überreiter, O., 2691.

Valentine, J. C., 2564.
Vallée, A., 2492, 2493.
Vanbreuseghem, R., 2707.
Van Demark, N. L., 2663.
Varfolomeeva, A. A., (See Warfolomejeva).
Vawter, G. F., 2594.
Vazquez, J. J., 2521.
Velle, W., 2675.
Venzke, W. G., 2679.
Vickers, H. R., 2382.
Villella, J. B., 2543.
Virat, B., 2492, 2493.
Visek, W. J., 2618.

Wahby, A. M., 2380.
Wakeley, C., 2551.
Walker, E. C., 2435.
Walter, H., 2653.
Warfolomejeva, A. A., 2428.
Watanabe, M., 2660.
Watkius, J. R., 2506.
Wearden, S., 2662.
Webster, W. M., 2427, 2700.
Wecker, E., 2476, 2500.
Weigle, W. O., 2521.
Weiss, K., 2407.
Whittlestone, W. G., 2640.
Widdowson, E. M., 2591, 2592.
Wilkinson, J., 2707.
Williams, A. D., 2598.
Williams, L. F., 2435.
Wilson, D., 2502, 2503.
Wilson, H. G., 2522.
Wilson, I. A. N., 2540.
Wise, H. M., 2434.
With, T. K., 2654.
Woernle, H., 2496.
Wolkoff, S., 2671.
Worley, D. E., 2545.
Van der Wouden, M., 2621.
Wrenn, T. R., 2676.
Wright, H. N., 2619.
Wright, J. F., 2678.
Wroblewski, A., 2520.
Wyne, J. W., 2612.

Yamamoto, I., 2681.
Yamashita, J., 2536.
Yancey, F. S., 2465.
Yevich, P. P., 2614.
Youmans, G. P., 2399.
Zabolotnuii, I. I., 2628.
Zachariae, F., 2667, 2668, 2669.

Žák, F., 2432.
Zappasodi, P., 2395.
Zarzycki, J., 2404.
Zimmermann, T., 2489.
Zsigmond, L., 2497.

ERRATA

V.B. 28, abst. 887. In title translation and lines 3, 9 and 11 of abst., for "zinc phosphate" read: zinc phosphide.

abst. 1066, line 5 of abst. Please delete the words "and coughing".

abst 1440. In line 8 of abst., for "Muktsewar" read: Mukteswar.

abst. 1554. In line 1 of abst., for "cystisine" read: cytisine.

ABBREVIATIONS OF NAMES OF PUBLICATIONS

The abbreviations used in *Index Veterinarius* and *The Veterinary Bulletin* are those of the *World List of Scientific Periodicals published in the years* 1900-1950, 3rd Edit. (1952), London : Butterworths Scientific Publications.

SOME RECENT PUBLICATIONS OF THE COMMONWEALTH BUREAU OF ANIMAL HEALTH

NEOPLASMS OF THE DOMESTICATED MAMMALS

by E. COTCHIN, M.R.C.V.S., *Royal Veterinary College, London*

Crown 4to stiff cover pp.xv + 100

A comprehensive review covering mainly the period from 1932 onwards.

950 references

Price 20s.

SALMONELLOSIS IN ANIMALS

by A. BUXTON, PhD., M.R.C.V.S., *Dept. Vety. Pathology, University of Liverpool*

Medium 8vo stiff cover pp.v + 209

A comprehensive review covering domestic animals, poultry, fur-bearing animals, rodents, reptiles and arthropods.

1,750 references

Price 25s.

VETERINARY REVIEWS AND ANNOTATIONS

A half-yearly review of topical subjects.

Annual Subscription 25s.

All the above obtainable from :—

Central Sales Branch, COMMONWEALTH AGRICULTURAL BUREAUX, Farnham Royal, Nr. Slough, Bucks, England.

Index Veterinarius

A COMPLETE BIBLIOGRAPHY OF VETERINARY LITERATURE

This subject and author index of current literature on veterinary and related sciences is produced by the Commonwealth Bureau of Animal Health and was first published in 1933. It is issued quarterly and each year about 10,000 references are listed. Arrangement of material is designed to facilitate rapid location of information.

For compilation of the *Index* nearly a thousand periodicals in 22 languages are searched and coverage embraces the whole world.

Annual subscription is £5 and orders may be sent to the Central Sales Branch, Commonwealth Agricultural Bureaux, Farnham Royal, Slough, Bucks.

Volumes 13—25 (1945-1957) are still available. Stocks of other volumes are incomplete. Details on request.

AUSTRALIA — UNIVERSITY OF SYDNEY

CLINICAL VETERINARY PATHOLOGIST

Applications are invited for the above position at the University Veterinary Hospital at Camden, 35 miles from Sydney. Experience in all veterinary pathological investigations is essential. The appointee will be assisted by one senior laboratory assistant. Duties will include the diagnostic examination of clinical material, teaching and research.

The salary is within the range of £A1,500–90–£2,100 per annum, plus cost of living adjustment and will be subject to deductions under the State Superannuation Act.

Under the Staff Members' Housing Scheme in cases approved by the University and its Bankers, married men may be assisted by loans to purchase a house.

Further particulars and information as to the method of application may be obtained from the Secretary, Association of Universities of the British Commonwealth, 36 Gordon Square, London, W.C.1.

The closing date for the receipt of applications, in Australia and London, is **15th August, 1958.**

AUSTRALIA — UNIVERSITY OF SYDNEY

ASSOCIATE PROFESSOR OF VETERINARY ANATOMY

Applications are invited for the above position in the Faculty of Veterinary Science. The successful applicant will be required to engage in teaching and research in Veterinary Anatomy. Postgraduate experience in the subject is essential.

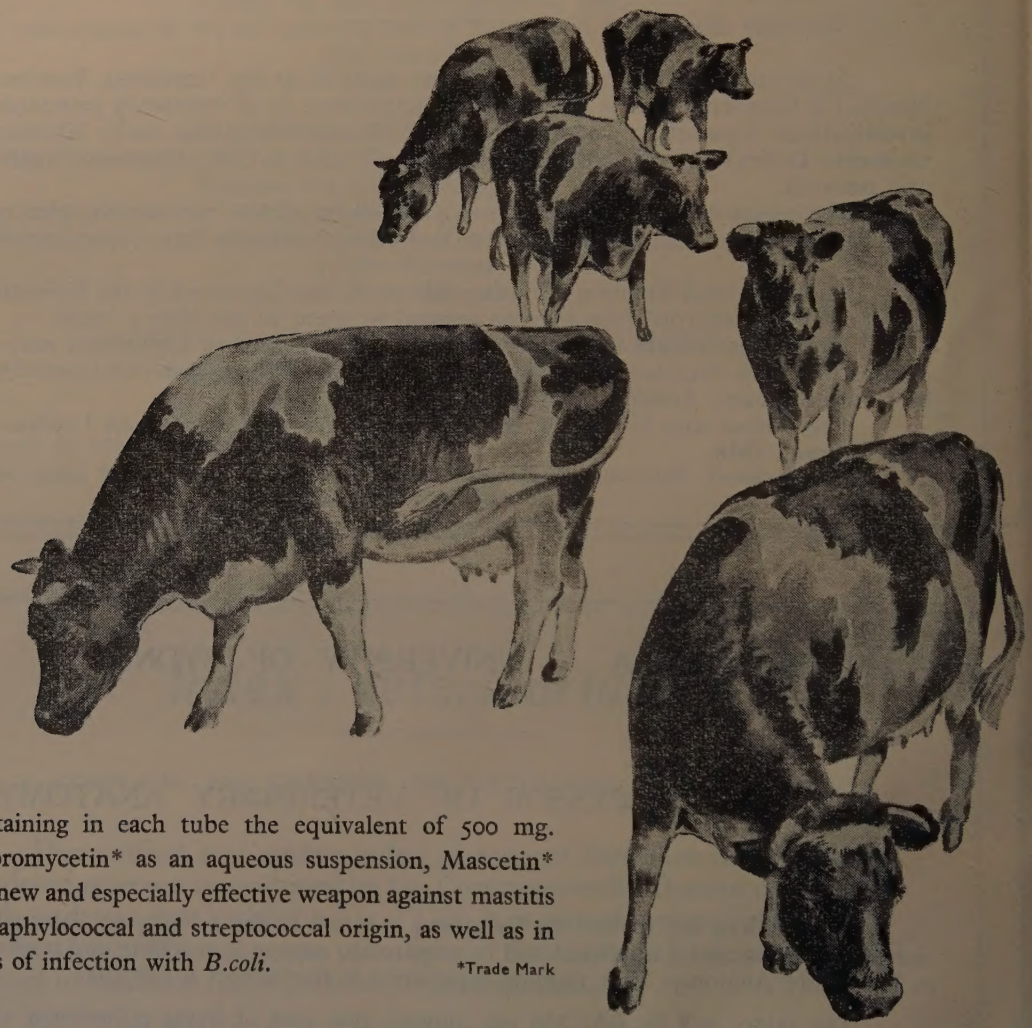
The salary will be £A2,850 per annum, plus cost of living adjustment and will be subject to deductions under the State Superannuation Act.

Under the Staff Members' Housing Scheme in cases approved by the University and its Bankers, married men may be assisted by loans to purchase a house.

Further particulars and information as to the method of application may be obtained from the Secretary, Association of Universities of the British Commonwealth, 36 Gordon Square, London, W.C.1.

The closing date for the receipt of applications, in Australia and London, is *15th September,* 1958.

A new, more powerful treatment for MASTITIS



Containing in each tube the equivalent of 500 mg. Chloromycetin* as an aqueous suspension, Mascetin* is a new and especially effective weapon against mastitis of staphylococcal and streptococcal origin, as well as in cases of infection with *B.coli.*

*Trade Mark

MASCETIN

Chloromycetin Intramammary Suspension 15%

DOSAGE:

Best results are obtained by administering into the infected teat the contents of 1 tube of Mascetin once or twice daily, depending on the severity of the condition, until cessation of clinical symptoms.

MEDICAMENTA VERA

PARKE, DAVIS & COMPANY, LTD., *(Inc. U.S.A.)* HOUNSLOW · MIDDLESEX · Tel: Hounslow 2361

820